Vol. 1113 Number 4

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

1790 ***Celebrating 200 Years of Creativity*** 1990

April 24, 1990

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed.

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $10.00 each; copies of TRADEMARKS at $1.50 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1109 O.G. 3 on Dec. 5, 1989.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

The search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar in relation to the German Mark as of March 1, 1990, and was announced in the *Official Gazette* at 1111 O.G. 24 on Feb. 20, 1990.

International PCT fees were changed on June 1, 1989 due to a difference in the exchange rate of the U.S. dollar in relaton to the Swiss Franc and were announced in the *Official Gazette* at 1102 O.G. 90 on May 30, 1989.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	550.00
—Corresponding prior U.S. national application filed	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as ISA	1242.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA.	400.00
—Additional examination fee, per additional invention	130.00
—ISA not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee	436.00
Basic Supplemental fee (for each page over 30)	9.00
Designation fee per country or region for the first 10 national or regional offices	106.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	134.00

U.S. National Stage fees

	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	30.00	30.00

Jan. 26, 1990

JEFFREY M. SAMUELS
Acting Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on April 21, 1987 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,658,441 through 4,660,222
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on April 19, 1983 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,380,090 through 4,380,832
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 and before Aug. 27, 1982, in force

beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$245.00
By other than a small entity.....$490.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$495.00
By other than a small enttity.....$990.00"

The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27,1982.....$120.00

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED FEBRUARY 4, 1990
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,313,548	06/222,659	2/02/82
4,313,745	06/219,680	2/02/82
4,313,751	06/235,923	2/02/82
4,313,755	06/230,777	2/02/82
4,313,914	06/225,909	2/02/82
4,313,946	06/228,853	2/02/82
4,313,959	06/258,097	2/02/82
4,314,038	06/248,882	2/02/82
4,314,163	06/219,215	2/02/82
4,567,616	06/698,697	2/04/86
4,567,618	06/615,520	2/04/86
4,567,620	06/502,320	2/04/86
4,567,621	06/587,624	2/04/86
4,567,623	06/654,423	2/04/86
4,567,625	06/676,569	2/04/86
4,567,634	06/632,221	2/04/86
4,567,638	06/574,054	2/04/86
4,567,643	06/691,302	2/04/86
4,567,647	06/591,960	2/04/86
4,567,651	06/433,315	2/04/86
4,567,652	06/442,518	2/04/86
4,567,653	06/605,371	2/04/86
4,567,662	06/627,838	2/04/86
4,567,680	06/572,886	2/04/86
4,567,683	06/547,990	2/04/86
4,567,691	06/595,732	2/04/86
4,567,693	06/543,851	2/04/86
4,567,699	06/669,750	2/04/86
4,567,710	06/702,883	2/04/86
4,567,715	06/450,663	2/04/86
4,567,724	06/620,219	2/04/86
4,567,731	06/669,076	2/04/86
4,567,732	06/497,893	2/04/86
4,567,736	06/728,429	2/04/86
4,567,756	06/593,026	2/04/86
4,567,763	06/536,088	2/04/86
4,567,764	06/565,509	2/04/86
4,567,779	06/595,391	2/04/86
4,567,780	06/588,921	2/04/86
4,567,787	06/550,333	2/04/86
4,567,791	06/465,320	2/04/86
4,567,798	06/658,332	2/04/86
4,567,800	06/569,917	2/04/86
4,567,805	06/571,506	2/04/86
4,567,821	06/618,587	2/04/86
4,567,824	06/583,488	2/04/86
4,567,836	06/602,806	2/04/86
4,567,839	06/505,806	2/04/86
4,567,840	06/509,365	2/04/86
4,567,841	06/472,240	2/04/86
4,567,844	06/621,983	2/04/86
4,567,856	06/654,169	2/04/86
4,567,867	06/622,656	2/04/86
4,567,874	06/565,519	2/04/86
4,567,876	06/667,152	2/04/86
4,567,877	06/635,603	2/04/86
4,567,878	06/737,864	2/04/86
4,567,879	06/718,667	2/04/86
4,567,886	06/455,905	2/04/86
4,567,911	06/664,801	2/04/86
4,567,913	06/672,295	2/04/86
4,567,922	06/594,118	2/04/86
4,567,930	06/496,374	2/04/86
4,567,931	06/538,165	2/04/86
4,567,945	06/565,679	2/04/86
4,567,947	06/531,937	2/04/86
4,567,948	06/692,954	2/04/86
4,567,951	06/560,425	2/04/86
4,567,952	06/489,301	2/04/86
4,567,956	06/357,650	2/04/86
4,567,961	06/535,599	2/04/86
4,567,964	06/627,789	2/04/86
4,567,968	06/632,669	2/04/86
4,567,983	06/663,333	2/04/86
4,567,985	06/667,222	2/04/86
4,567,990	06/523,723	2/04/86
4,567,997	06/465,950	2/04/86
4,567,999	06/456,054	2/04/86
4,568,007	06/573,295	2/04/86
4,568,014	06/537,187	2/04/86
4,568,017	06/691,407	2/04/86
4,568,018	06/681,513	2/04/86
4,568,025	06/616,079	2/04/86
4,568,036	06/621,948	2/04/86
4,568,049	06/572,918	2/04/86
4,568,051	06/568,337	2/04/86
4,568,060	06/372,066	2/04/86
4,568,068	06/454,547	2/04/86

Patent Number	Serial Number	Issue Date
4,568,070	06/591,629	2/04/86
4,568,076	06/640,825	2/04/86
4,568,077	06/632,033	2/04/86
4,568,079	06/602,609	2/04/86
4,568,083	06/441,566	2/04/86
4,568,085	06/604,884	2/04/86
4,568,090	06/663,722	2/04/86
4,568,097	06/570,946	2/04/86
4,568,099	06/637,250	2/04/86
4,568,103	06/635,072	2/04/86
4,568,107	06/677,984	2/04/86
4,568,108	06/621,670	2/04/86
4,568,111	06/527,547	2/04/86
4,568,112	06/614,796	2/04/86
4,568,116	06/658,494	2/04/86
4,568,118	06/623,534	2/04/86
4,568,119	06/402,767	2/04/86
4,568,127	06/526,278	2/04/86
4,568,131	06/666,643	2/04/86
4,568,132	06/683,694	2/04/86
4,568,138	06/669,388	2/04/86
4,568,144	06/636,065	2/04/86
4,568,150	06/594,317	2/04/86
4,568,152	06/505,513	2/04/86
4,568,156	06/668,993	2/04/86
4,568,193	06/629,033	2/04/86
4,568,202	06/713,462	2/04/86
4,568,207	06/614,640	2/04/86
4,568,212	06/600,950	2/04/86
4,568,225	06/606,831	2/04/86
4,568,227	06/505,884	2/04/86
4,568,229	06/720,477	2/04/86
4,568,236	06/400,994	2/04/86
4,568,248	06/604,237	2/04/86
4,568,281	06/561,888	2/04/86
4,568,285	06/689,138	2/04/86
4,568,306	06/593,599	2/04/86
4,568,309	06/578,901	2/04/86
4,568,314	06/616,551	2/04/86
4,568,323	06/607,939	2/04/86
4,568,327	06/583,733	2/04/86
4,568,331	06/542,484	2/04/86
4,568,335	06/415,757	2/04/86
4,568,340	06/559,344	2/04/86
4,568,350	06/600,719	2/04/86
4,568,364	06/592,135	2/04/86
4,568,381	06/621,000	2/04/86
4,568,382	06/557,570	2/04/86
4,568,395	06/732,108	2/04/86
4,568,401	06/716,512	2/04/86
4,568,404	06/718,167	2/04/86
4,568,409	06/552,737	2/04/86
4,568,424	06/668,539	2/04/86
4,568,425	06/613,312	2/04/86
4,568,428	06/510,832	2/04/86
4,568,430	06/697,964	2/04/86
4,568,433	06/649,570	2/04/86
4,568,440	06/527,690	2/04/86
4,568,475	06/693,394	2/04/86
4,568,486	06/656,655	2/04/86
4,568,487	06/446,477	2/04/86
4,568,499	06/629,217	2/04/86
4,568,510	06/484,391	2/04/86
4,568,511	06/476,611	2/04/86
4,568,522	06/417,309	2/04/86
4,568,538	06/742,717	2/04/86
4,568,549	06/543,538	2/04/86
4,568,563	06/747,389	2/04/86
4,568,567	06/659,164	2/04/86
4,568,583	06/615,275	2/04/86
4,568,584	06/673,395	2/04/86
4,568,606	06/681,974	2/04/86
4,568,634	06/671,268	2/04/86
4,568,637	06/521,857	2/04/86
4,568,643	06/548,615	2/04/86
4,568,644	06/640,247	2/04/86
4,568,652	06/660,666	2/04/86
4,568,669	06/537,047	2/04/86
4,568,671	06/509,451	2/04/86
4,568,672	06/644,732	2/04/86
4,568,678	06/592,045	2/04/86
4,568,680	06/678,235	2/04/86
4,568,684	06/682,070	2/04/86
4,568,688	06/601,188	2/04/86
4,568,691	06/684,253	2/04/86
4,568,694	06/504,459	2/04/86
4,568,698	06/652,893	2/04/86
4,568,714	06/605,464	2/04/86
4,568,728	06/630,925	2/04/86
4,568,736	06/650,944	2/04/86
4,568,762	06/686,791	2/04/86
4,568,783	06/747,739	2/04/86
4,568,803	06/583,076	2/04/86
4,568,807	06/637,172	2/04/86
4,568,818	06/577,298	2/04/86
4,568,819	06/451,066	2/04/86
4,568,824	06/471,758	2/04/86
4,568,827	06/504,921	2/04/86
4,568,836	06/464,938	2/04/86
4,568,868	06/640,523	2/04/86
4,568,869	06/568,075	2/04/86
4,568,871	06/574,222	2/04/86
4,568,872	06/497,625	2/04/86
4,568,875	06/568,671	2/04/86
4,568,888	06/550,070	2/04/86
4,568,893	06/696,748	2/04/86
4,568,902	06/480,754	2/04/86
4,568,907	06/639,876	2/04/86
4,568,908	06/686,170	2/04/86
4,568,918	06/619,935	2/04/86
4,568,926	06/609,276	2/04/86
4,568,931	06/443,686	2/04/86
4,568,942	06/417,252	2/04/86
4,568,943	06/499,396	2/04/86
4,568,946	06/547,834	2/04/86
4,568,949	06/606,661	2/04/86
4,568,972	06/552,940	2/04/86
4,568,994	06/540,030	2/04/86
4,569,000	06/430,997	2/04/86
4,569,008	06/733,137	2/04/86
4,569,054	06/505,485	2/04/86
4,569,056	06/604,853	2/04/86
4,569,057	06/624,528	2/04/86
4,569,058	06/596,659	2/04/86
4,569,071	06/593,850	2/01/86
4,569,077	06/567,165	2/04/86
4,569,083	06/578,019	2/04/86

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,684,023, Re. S. N. 07/389,341, Filed Aug. 3, 1989, Cl. 206/459, CONTENT-IDENTIFYING CARTON STRUCTURE, Jeffery J. Cortopassi, Owner of Record: *Taco Bell, Corp., Irvine, Calif.*, Attorney or Agent: Leopard Presser, Ex. Gp.: 241

4,730,413, Re. S. N. 07/495,874, Filed Mar. 15, 1990, Cl. 49/48, REMOVABLE AUTOMOBLIE SIDE WINDOW, Donald J. Henry, Owner of Record: *Nami Products, Inc., New Albany, Pa.*, Attorney or Agent: Mark Levy, Ex. Gp.: 357

4,730,914, Re. S. N. 07/493,956, Filed Mar. 15, 1990, Cl. 350/629, ELONGATE ARCUATE MIRROR WITH GENERALLY CONVEX SURFACE PORTIONS, Thomas R. Stout, Owner of Record: *Inventor*, Attorney or Agent: Douglas W. Sprinkle, Ex. Gp.: 257

4,733,942, Re. S. N. 07/492,779, Filed Mar. 13, 1990, Cl. 350/96.34, OPTICAL FIBER COATED WITH AN ORGANOPOLYSILOXANE CURABLE WITH ACTING RAYS,

Yoshinori Hida, et al., Owner of Record: *Shin-Etsu Chemical Co., Chiyoda, Japan*, Attorney or Agent: Hopgood, Calimafde, Kalil, Blaustein & Judlowe, Ex. Gp.: 251

4,763,550, Re. S. N. 07/495,480, Filed Mar. 19, 1990, Cl. 83/191, SELF EQUALIZING PIERCING MACHINE, Edward J. Waltonen et al., Owner of Record: *Lamb Robb, Bloomfield Hills, Mich.*, Attorney or Agent: Donald L. Wood, Ex. Gp.: 324

4,843,767, Re. S. N. 07/478,123, Filed Feb. 9, 1990, Cl. 51/247, AUTOMATIC FORAGE HARVESTER KNIFE SHARPENING SYSTEM, Stanley R. Johnson, Owner of Record: *Deere & Company, Moline, Ill.*, Attorney or Agent: Joel S. Carter, Ex. Gp.: 323

4,878,210, Re. S. N. 07/494,391, Filed Mar. 16, 1990, Cl. 367/137, VISUALIZING METHOD FOR THREE DIMENSIONAL STANDING WAVE SOUND FIELD, Hideto Mitome, Owner of Record: *Agency of Industrial Science & Tech., Ministry of International Trade & Industry / Tokyo, Japan*, Attorney or Agent: Gregory J. Maier, Ex. Gp.: 222

Requests for Reexamination Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

4,256,789, Reexam No. 90/001,960, Requested Mar. 15, 1990, Cl. 428/35, INJECTION MOLDED POLYETHLYENE TEREPHTHALATE PARISON FOR BLOW MOLDING, S. Suzuki, et al., Owner of Record: *Yoshino Kogyosho Co., Ltd., Tokyo, Japan*, Attorney or Agent: Oliff & Berridge, Ex. Gp.: 150, Requester: Owner

4,695,901, Reexam No. 90/001,958, Requested Mar. 13, 1990, Cl. 380/5, METHOD AND APPARATUS FOR REMOVING PSUEDO-SYNC AND/OR AGC PULSES FROM A VIDEO SIGNAL, John O. Ryan, Owner of Record: *Macrovision, Santa Clara, Calif.*, Attorney or Agent: Unknown, Ex. Gp.: 230, Requester: W.B. Day, Overland Park, Kans.

4,793,087, Reexam No. 90/001,961, Requested Mar. 16, 1990, Cl. 43/23, APPARATUS FOR MOUNTING POWER TRANSMISSION BELTS ON AND REMOVING SAME FROM PULLEYS, Yoshihiko Kwmujama, et al., Owner of Record: *Mitsubishi Belting Ltd., Nacata, Japan*, Attorney or Agent: Woods, Phillips, Mason, et al., Ex. Gp.: 320, Requester: Owner

4,845,059, Reexam No. 90/001,959, Requested Mar. 15, 1990, Cl. 501/98, PROCESS FOR PRODUCING A SIALON POWDER, Yasuhiko Kohtoku, Owner of Record: *Ube Industries, Ltd., Ube-Shi, Japan*, Attorney or Agent: Finnegan, Henderson, Farabow, et al., Ex. Gp.: 110, Requester: Owner

4,849,032, Reexam No. 90/001,957, Requested Mar. 14, 1990, Cl. 148/11.50, ORTHODONTIC COIL SPRING AND METHOD OF MAKING THE SAME, Kozo Kawaguchi, Owner of Record: *GAC International, Inc., Central Islip, N.Y.*, Attorney or Agent: M.D. Giarrantana, Ex. Gp.: 110, Requester: Fredrickson & Byron, Minneapolis, Minn.

Erratum

The following registration number, listed in the "Trademark Registrations Issued" section of the Trademark Official Gazette of Jan. 30, 1990, was listed inadvertently:

TM 191 1,580,472

Consequently, the certificate of registration bearing the above-identified registration number was not issued on the date indicated, and the registration number has been vacated.

Mar. 23, 1990 PATRICIA M. DAVIS
Administrator for Trademark Operations

Erratum

The Registrant of Registration No. 880,322 listed in the "Index of Registrants" section of the Trademark Official Gazette of Dec. 19, 1989 at TMI 31, was incorrectly identified as "RCV Corp., dba Valcon".

The Registrant's name as corrected is "IRRIGATION SPECIALTIES COMPANY".

Mar. 23. 1990 PATRICIA M. DAVIS
Administrator for Trademark Operations

Erratum

The following registration number was inadvertently listed as cancelled in the "Trademark Registrations Cancelled, Section 8" section of the Trademark Official Gazette of Aug. 8, 1989:

TM 216 1,225,067

Consequently, the above-identified registration is still active.

Mar. 23, 1990 PATRICIA M. DAVIS
Administrator for Trademark Operations

Errata

The following registration numbers were inadvertently listed as cancelled in the "Trademark Registrations Cancelled, Section 8" section of the Trademark Official Gazette of Jan. 9, 1990:

TM 170 1,248,826
TM 173 1,249,328

Consequently, the above-identified registrations are still active.

Mar. 23, 1990 PATRICIA M. DAVIS
Administrator for Trademark Operations

Reclassification Alert Report

This report is a summary of classification changes which became effective by issuance of Classification Orders in January - March 1990. Information includes:

- subclasses established or abolished
- subclass title, indent, or position change
- classes where existing subclass definitions have changed

This Reclassification Alert Report may appear form time to time in the Official Gazette, and is intended to provide an interim notice of classification changes pending publication of the Manual of Classification and revisions thereto.

Mar. 16, 1990 WILLIAM S. LAWSON
Administrator for Documentation

Class	First Subclass	Last Subclass	Action	Order Number
015			Definition	1324
019			Definition	1325
028			Definition	1318
029			Definition	1319
029			Definition	1318
029	004.5		Abolish	1324
029	004.51	004.56	Establish	1324
029	006		Abolish	1324
029	006.01		Establish	1324
029	017	019	Abolish	1324
029	017.1	017.9	Establish	1324
029	018.1		Establish	1324
029	023		Abolish	1324
029	023.1		Establish	1324
029	023.5		Abolish	1324
029	023.51		Establish	1324
029	025.01	025.03	Establish	1324
029	081		Abolish	1324
029	081.01	081.02	Establish	1324
029	081.021		Establish	1324
029	081.03	081.09	Establish	1324
029	081.1		Establish	1324
029	081.11	081.17	Establish	1324
029	148.3	148.4	Abolish	1324
029	149.5		Abolish	1324
029	150		Abolish	1324
029	155		Abolish	1324
029	156.4	156.6	Abolish	1324
029	156.61	156.63	Abolish	1324
029	156.7	156.8	Abolish	1324
029	157		Abolish	1324
029	157.1		Abolish	1324
029	157.3	157.6	Abolish	1324
029	158	159	Abolish	1324
029	159.01	159.03	Abolish	1324
029	159.1	159.3	Abolish	1324
029	569.1		Abolish	1324
029	570.1		Abolish	1324
029	888		Establish	1324
029	888.01		Establish	1324
029	888.011	888.012	Establish	1324
029	888.02		Establish	1324
029	888.021	888.025	Establish	1324
029	888.03	888.04	Establish	1324
029	888.041	888.049	Establish	1324
029	888.05		Establish	1324
029	888.06		Establish	1324
029	888.07		Establish	1324
029	888.071	888.076	Establish	1324
029	888.08	888.09	Establish	1324
029	888.091	888.092	Establish	1324
029	888.1	888.4	Establish	1324
029	888.41	888.45	Establish	1324
029	888.451	888.453	Establish	1324
029	888.46		Establish	1324
029	888.51		Establish	1324
029	888.61		Establish	1324
029	889		Establish	1324
029	889.1	889.2	Establish	1324
029	889.21	889.23	Establish	1324
029	889.3	889.6	Establish	1324
029	889.61		Establish	1324
029	889.7		Establish	1324
029	889.71	889.72	Establish	1324
029	889.721	889.722	Establish	1324
029	890		Establish	1324
029	890.01	890.03	Establish	1324
029	890.031	890.039	Establish	1324
029	890.04		Establish	1324
029	890.041	890.049	Establish	1324
029	890.05		Establish	1324
029	890.051	890.054	Establish	1324
029	890.06	890.09	Establish	1324
029	890.1		Establish	1324
029	890.11	890.12	Establish	1324
029	890.121	890.129	Establish	1324

Class	First Subclass	Last Subclass	Action	Order Number
029	890.13		Establish	1324
029	890.131	890.132	Establish	1324
029	890.14		Establish	1324
029	890.141	890.149	Establish	1324
029	890.15		Establish	1324
029	891		Establish	1324
029	891.1	891.2	Establish	1324
029	892		Establish	1324
029	892.1		Establish	1324
029	892.11		Establish	1324
029	892.2	892.3	Establish	1324
029	893		Establish	1324
029	893.1	893.3	Establish	1324
029	893.31	893.37	Establish	1324
029	894		Establish	1324
029	894.1	894.3	Establish	1324
029	894.31	894.32	Establish	1324
029	894.321	894.325	Establish	1324
029	894.33		Establish	1324
029	894.331	894.333	Establish	1324
029	894.34		Establish	1324
029	894.341	894.345	Establish	1324
029	894.35		Establish	1324
029	894.351	894.354	Establish	1324
029	894.36		Establish	1324
029	894.361	894.362	Establish	1324
029	894.37	894.38	Establish	1324
029	894.381		Establish	1324
029	895		Establish	1324
029	895.1	895.2	Establish	1324
029	895.21		Establish	1324
029	895.211	895.213	Establish	1324
029	895.22	895.23	Establish	1324
029	895.3		Establish	1324
029	895.31	895.33	Establish	1324
029	897		Establish	1324
029	897.1	897.3	Establish	1324
029	897.31		Establish	1324
029	897.312		Establish	1324
029	897.32	897.35	Establish	1324
029	898		Establish	1324
029	898.01	898.04	Establish	1324
029	898.041	898.049	Establish	1324
029	898.05		Establish	1324
029	898.051	898.059	Establish	1324
029	898.06		Establish	1324
029	898.061	898.069	Establish	1324
029	898.07	898.09	Establish	1324
029	898.1		Establish	1324
029	898.11	898.15	Establish	1324
029	899		Establish	1324
029	899.1		Establish	1324
033			Definition	1318
033			Definition	1324
034			Definition	1325
040			Definition	1325
049			Definition	1325
051			Definition	1324
052			Definition	1324
057			Definition	1325
057			Definition	1318
060			Definition	1325
072			Definition	1325
072			Definition	1324
073			Definition	1325
073			Definition	1318
074			Definition	1324
074	394		Abolish	1325
074	626		Abolish	1325
074	645		Abolish	1325
074	660		Abolish	1325
074	674	675	Abolish	1325
074	677		Abolish	1325
074	679		Abolish	1325
074	681	682	Abolish	1325
074	686	691	Abolish	1325

Class	First Subclass	Last Subclass	Action	Order Number
074	694	695	Abolish	1325
074	700	701	Abolish	1325
074	705		Abolish	1325
074	710		Abolish	1325
074	710.5		Abolish	1325
074	711		Abolish	1325
074	713	715	Abolish	1325
074	720.5		Abolish	1325
074	730	733	Abolish	1325
074	730.1		Establish	1325
074	731.1		Establish	1325
074	732.1		Establish	1325
074	733.1		Establish	1325
074	740		Abolish	1325
074	750	770	Abolish	1325
074	772	774	Abolish	1325
074	776	794	Abolish	1325
074	796	805	Abolish	1325
074	810		Abolish	1325
074	810.1	810.2	Establish	1325
074	812		Abolish	1325
074	880	892	Establish	1325
083			Definition	1324
091			Definition	1325
092			Definition	1324
092			Definition	1325
123			Definition	1324
128			Definition	1318
134			Definition	1324
134	900	902	Establish	1321
134	D001	D002	Abolish	1321
138			Definition	1324
140			Definition	1324
157			Definition	1324
165			Definition	1324
172			Definition	1324
174	068.5		Abolish	1319
174	250	268	Establish	1319
180			Definition	1325
184			Definition	1325
188			Definition	1325
192			Definition	1325
209			Definition	1318
219			Definition	1319
228			Definition	1324
235			Definition	1329
241			Definition	1324
242			Definition	1318
242			Definition	1324
250	201		Abolish	1329
250	201.1	201.9	Establish	1329
250	203		Abolish	1329
250	203.1	203.7	Establish	1329
250	206.1	206.3	Establish	1329
250	208	209	Abolish	1329
250	208.1	208.6	Establish	1329
250	227		Abolish	1329
250	227.11	227.32	Establish	1329
250	231		Abolish	1329
250	231.1	231.19	Establish	1329
250	578		Abolish	1329
250	578.1		Establish	1329
250	900	908	Establish	1329
251			Definition	1325
252			Definition	1327
277			Definition	1324
280			Definition	1325
285			Definition	1324
303			Definition	1320
307			Definition	1329
310			Definition	1318
310			Definition	1325
315			Definition	1318
318			Definition	1325
322			Definition	1325
322			Definition	1318

Class	First Subclass	Last Subclass	Action	Order Number
323			Definition	1318
324	055	065	Abolish	1318
324	073		Abolish	1320
324	073.1		Establish	1320
324	207	208	Abolish	1326
324	207.11	207.26	Establish	1326
324	475		Abolish	1318
324	600	727	Establish	1318
328			Definition	1318
330			Definition	1319
333			Definition	1318
334			Definition	1318
335			Definition	1319
340			Definition	1318
356			Definition	1329
356			Definition	1318
358	213.14		Abolish	1329
361			Definition	1318
361			Definition	1319
362			Definition	1319
364			Definition	1318
365			Definition	1319
365			Definition	1329
366			Definition	1325
369			Definition	1319
371			Definition	1320
379			Definition	1318
384			Definition	1324
411			Definition	1324
416			Definition	1325
416			Definition	1324
418			Definition	1325
422	068		Abolish	1328
422	068.1		Establish	1328
422	082.01	082.09	Establish	1328
422	082.11	082.13	Establish	1328
425			Definition	1324
427			Definition	1319
427			Definition	1324
428			Definition	1324
428			Definition	1319
437			Definition	1324
440			Definition	1325
455			Definition	1319
464			Definition	1325
474			Definition	1325
474			Definition	1324
475	001	349	Establish	1325
475	900	904	Establish	1325
548	262	269	Abolish	1327
548	262.2		Establish	1327
548	262.4		Establish	1327
548	262.6		Establish	1327
548	262.8		Establish	1327
548	263.2		Establish	1327
548	263.4		Establish	1327
548	263.6		Establish	1327
548	263.8		Establish	1327
548	264.2		Establish	1327
548	264.4		Establish	1327
548	264.6		Establish	1327
548	264.8		Establish	1327
548	265.2		Establish	1327
548	265.4		Establish	1327
548	265.6		Establish	1327
548	265.8		Establish	1327
548	266.2		Establish	1327
548	266.4		Establish	1327
548	266.6		Establish	1327
548	266.8		Establish	1327
548	267.2		Establish	1327
548	267.4		Establish	1327
548	267.6		Establish	1327
548	267.8		Establish	1327
548	268.2		Establish	1327
548	268.4		Establish	1327

Class	First Subclass	Last Subclass	Action	Order Number
548	268.6		Establish	1327
548	268.8		Establish	1327
548	269.2		Establish	1327
548	269.4		Establish	1327
800	001		Abolish	1322
800	002		Establish	1322
800	200		Establish	1322
800	205		Establish	1322
800	220		Establish	1322
800	230		Establish	1322
800	235		Establish	1322
800	240		Establish	1322
800	250		Establish	1322
800	255		Establish	1322
800	D001	D071	Establish	1322
901			Definition	1325
D003			*Excl Change	1323
D006			*Excl Change	1323
D007	001	040	Abolish	1323
D007	042	058	Abolish	1323
D007	068		Abolish	1323
D007	070	084.1	Abolish	1323
D007	098	152	Abolish	1323
D007	300.1	300.2	Establish	1323
D007	368		Title Change	1323
D007	392.1		Establish	1323
D007	396.1	396.6	Establish	1323
D007	401.1	401.2	Establish	1323
D007	412		Title Change	1323
D007	500	700	Establish	1323
D008			*Excl & Sch changes	1323
D009			*Excl Change	1323
D010	046.2	046.3	Establish	1323
D011			*Sch Change	1323
D014	110		Title Change	1323
D014	157	158	Title change	1323
D015			*Excl & Sch Changes	1323
D021			*Sch Change	1323
D023			*Excl & Sch Changes	1323
D025	119		Title Change	1323
D028			*Sch Change	1323
D029			*Excl Change	1323
D034			*Excl change	1323
D099			*Excl Change	1323

*Excl and Sch abbreviation are referring to references under the Exclusion and Search Notes of Design Classes

Status of PTO Services

The following is an update of the status of PTO services for March 1990

Service Item	FY 1990 Goal (Calendar Days)*	Monthly Average (Calendar Days)*
Filing Receipts:		
Patents	22	14
Trademarks	30	44
Patent/Trademark Copies:		
Special Window Coupons	24 Hours	16 Hours
Window Coupons	5	2
Mail Coupons	12	7
Letter Orders	16	14
Electronic Ordering Service (EOS)	11	4
Certified Copies:		
Trademark Registrations	21	19
Applications-As-Filed	17	11
File-Wrapper/Contents	N/A	14
Walk-up Certification	1	1
Patent appllication Expedited	5	4
Trademark Search Library:		
Filing Pending Marks	25	59
Filing Reg. Certificates	Issue Date+2 days	+2 Days
Filing Temp. Drawings	8	24
Assignments:		
Recording Patent-New Applications	43	37
Recording Patent-Mail Room Recpts.	20	37
Receipt Date of Bulk Pat. Docs. Returned by End of Month		Jan. 12-Jan. 19, 1990
Recording Trademarks	20	25
Receipt Date of Bulk Trademarks Documents Returned by end of Month		Jan. 31-Feb. 13, 1990
Avg. Days from Issue Fee Payment to Issue Date	90-100	104
Issue Fee Receipts Mailed	4 weeks prior to Issue Date	On Time
Patent Copies Available	95% on Issue Date	+53 Days
Trademark Copies Available	95% on Issue Date	99% on Issue Date

* Unless otherwise noted.

Mar. 30, 1990

THERESA A. BRELSFORD
Assistant Commissioner
for Administration

PATENT NOTICES

Certificates of Correction For Week of April 24, 1990

D. 302,091	4,818,356	4,837,137	4,844,169
Re. 32,969	4,820,102	4,837,544	4,844,491
4,586,792	4,821,203	4,837,573	4,844,526
4,667,472	4,821,675	4,837,766	4,844,740
4,671,658	4,821,868	4,838,340	4,845,042
4,676,919	4,822,502	4,838,368	4,845,188
4,684,215	4,822,867	4,838,624	4,845,338
4,695,459	4,824,746	4,838,797	4,845,357
4,703,660	4,825,461	4,839,112	4,845,534
4,722,416	4,825,692	4,839,280	4,845,679
4,729,652	4,825,804	4,839,397	4,845,933
4,749,459	4,826,094	4,839,536	4,845,978
4,765,896	4,826,989	4,839,549	4,846,359
4,771,017	4,827,275	4,839,908	4,846,635
4,772,854	4,827,832	4,840,069	4,846,666
4,783,997	4,828,396	4,840,149	4,846,672
4,788,377	4,829,088	4,840,159	4,846,796
4,788,564	4,830,315	4,840,366	4,846,818
4,789,115	4,830,910	4,840,532	4,846,990
4,797,473	4,831,021	4,840,724	4,847,222
4,798,875	4,831,072	4,840,744	4,847,316
4,800,450	4,831,354	4,841,084	4,847,552
4,800,716	4,831,613	4,841,167	4,847,645
4,802,657	4,831,654	4,841,209	4,848,577
4,802,997	4,833,096	4,841,460	4,848,667
4,805,585	4,833,625	4,841,772	4,848,783
4,810,707	4,833,873	4,842,383	4,849,182
4,810,712	4,834,523	4,842,408	4,851,840
4,810,946	4,834,606	4,842,488	4,855,032
4,811,281	4,834,705	4,842,492	4,855,302
4,812,541	4,834,860	4,842,700	4,858,486
4,812,556	4,835,072	4,842,846	4,859,043
4,812,652	4,835,451	4,843,269	4,860,906
4,812,685	4,835,513	4,843,432	4,866,282
4,813,294	4,835,586	4,843,452	4,876,941
4,813,631	4,835,714	4,843,479	4,879,264
4,815,712	4,836,229	4,843,785	4,884,285
4,815,807	4,836,404	4,843,866	4,889,888
4,815,823	4,836,508	4,844,030	4,891,504
4,816,298	4,836,525	4,844,045	
4,816,660	4,836,861	4,844,067	
4,818,347	4,837,082	4,844,125	

Disclaimers

4,484,995.—*Ronald G. Pirich*, Bay Shore; *David J. Larson, Jr.*, Huntington Station, both of N.Y. THERMALLY CONTROLLED SPUTTERING OF HIGH ANISOTROPY MAGNETIC MATERIAL. Patent dated Nov. 27, 1984. Disclaimer filed Jan. 9, 1990, by the assignee, Grumman Aerospace Corporation.

Hereby enters this disclaimer to the remaining term of said patent.

4,634,932.—*Ole K. Nilssen*, Barrington, Hills, Ill. LIGHTING SYSTEM. Patent dated Jan. 6, 1987. Disclaimer filed Feb. 2, 1990, by the inventor.

The term of this patent subsequent to December 2, 2003, has been disclaimed.

4,651,059.—*Ole K. Nilssen*, Barrington, Ill. HIGH-FREQUENCY POWER-LIMITED LIGHTING SYSTEM. Patent dated Mar. 17, 1987. Disclaimer filed Feb. 2, 1990, by the inventor.

The term of this patent subsequent to December 2, 2003, has been disclaimed.

4,667,133.—*Ole K. Nilssen*, Barrington Hills, Ill. POWER-LIMITED LIGHTING SYSTEM. Patent dated May 19, 1987. Disclaimer filed Feb. 2, 1990, by the inventor.

The term of this patent subsequent to December, 2, 2003, has been disclaimed.

4,866,329.—*Robert A. Ferenc*, Middletown, Conn. WIDE ANGLE WARNING LIGHT. Patent dated Sept. 12, 1989. Disclaimer filed Feb. 15, 1990, by the assignee, Whelen Technologies, Inc.

The term of this patent subsequent to December 20, 2005, has been disclaimed.

4,895,892.—*Yoshikatsu Satake; Takashi Kaneko; Yutaka Kobayashi; Yo Iizuka; Toshitak Kouyama; Takayuki Katto; Zenya Shiiki*, all of Iwaki, Japan. MELT-STABLE POLY(ARYLENE THIOETHER-KETONE) COMPOSITIONS. Patent dated Jan. 23, 1990. Disclaimer filed Feb. 14, 1990, by the assignee, Kureha Kagaku Kogyo K. K.

The term of this patent subsequent to October 10, 2006, has been disclaimed.

4,895,924.—*Yoshikatsu Satake; Yo Iizuka*, both of Iwaki; *Hiroyuki Endo*, Shinbayashi; *Toshitaka Kouyama*, Iwaki; *Takayuki Katto*, Iwaki; *Zenya Shiiki*, Iwaki, all of Japan. POLY(ARYLNE THIOETHER-KETONE) FIBERS AND PRODUCTION PROCESS THEREOF. Patent dated Jan. 23, 1990. Disclaimer filed Feb. 14, 1990, by the assignee, Kureha Kagaku Kogyo K. K.

The term of this patent subsequent to October 10, 2006, has been disclaimed

4,895,925.—*Yoshikatsu Satake; Takashi Kaneko; Yutaka Kobayashi; Yo Iizuka; Takayuki Katto; Zenya Shiiki*, all of Iwaki, Japan. MELT-STABLE POLY(ARYLENE THIOETHER-KETONE) AND PRODUCTION PROCESS THEREOF. Patent dated Jan. 23, 1990. Disclaimer filed Feb. 14, 1990, by the assignee, Kureha Kagaku Kogyo K. K.

The term of this patent subsequent to October 10, 2006, has been disclaimed

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Disclaimer and Dedication

4,585,583.—*Keith Roberson*, Freeland; *Don L. Stevens*, Sanford; *Harold E. Filter*, Midland, all of Mich. IN SITU SOLIDIFICATION OF ION EXCHANGE BEADS. Patent dated Apr. 29, 1986. Disclaimer and Dedication filed Dec. 18, 1989, by the assignee, The Dow Chemical Company.

Hereby disclaims and dedicates to the Public all claims of the said patent.

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PATENT EXAMINING CORPS

JAMES E. DENNY, Acting Assistant Commissioner
STEPHEN G. KUNIN, Acting Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF March 24, 1990

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action

CHEMICAL EXAMINING GROUPS

GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director 7-7-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director 9-1-88
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. V. FISHER, Acting Director 4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director 4-5-88
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director 1-28-87

ELECTRICAL EXAMINING GROUPS

INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—D. G. Kelly, Director 10-15-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director 2-27-87
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DESIGN, GROUP 290—K. L. CAGE, Director 2-6-86

MECHANICAL EXAMINING GROUPS

HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director 3-13-89
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SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—C. CROYLE, Acting Director 2-26-88
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director 4-2-89

Expiration of patents: The patents within the range of numbers indicated below expire during March 1990 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,718,937 to 3,723,991 inclusive
Plant Patents ..... 3,314 to 3,320 inclusive

REEXAMINATIONS

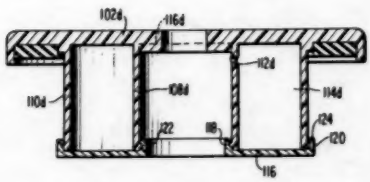
APRIL 24, 1990

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,942,680 (1258th)
SPRAY PAINT CONTAINER AND ATTACHMENT THEREFOR

Larry E. Seeley, 1278 Front St., Binghamton, N.Y. 13905, and Edward H. Seeley, Box 72, Great Bend, Pa. 18821

Reexamination Request Nos. 90/001,362, Oct. 28, 1987 and 90/001,400, Dec. 21, 1987.
Reexamination Certificate for Patent No. 3,942,680, issued Mar. 9, 1976, Ser. No. 465,695, Apr. 30, 1974.
Continuation-in-part of Ser. No. 384,280, Jul. 31, 1973, Pat. No. 3,858,810. This application Dec. 21, 1987, Ser. No. 465,695
Int. Cl.[5] B65D *45/16*
U.S. Cl. 220—324



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

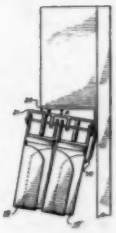
The patentability of claims **1–24** is confirmed.

1. A closure for a spray paint container comprising a cover adapted to carry a spray paint gun, means carried by said cover and cooperable with the container for releasably securing said cover to the container, means carried by said cover providing for communication between the interior of the container when said cover is releasably secured thereto and the exterior of the container including a housing having walls at least in part defining a chamber, said cover having an aperture therethrough in communication with said chamber, one of the walls of said housing having an aperture therethrough providing communciation between said chamber and the interior of the container when said cover is secured thereto, said apertures being spaced one from the other, and means carried by said cover and cooperable with the container for sealing the cover to the container when said cover is secured thereto whereby said apertures provide a vent passage through said cover and housing into the container.

B1 4,254,929 (1259th)
APPARATUS FOR ENABLING MOVEMENT OF A BINDER

Robert H. Popper, Jr., Mountain Lakes, N.J., assignor to J. S. Popper Inc.

Reexamination Request No. 90/001,509, May 13, 1988.
Reexamination Certificate for Patent No. 4,254,929, issued Mar. 10, 1981, Ser. No. 11,219, Feb. 12, 1979.
Filed May 13, 1988, Ser. No. 11,219
Int. Cl.[5] A47F *7/14*
U.S. Cl. 248—447



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–10** is confirmed.

1. An apparatus for enabling access to and automatic storage upon release of a binder relative to a support, comprising:

(a) means for enabling initial movement for access to and final movement for automatic storage of the binder relative to the support in a substantially off-horizontal plane; and

(b) means for enabling initial movement for automatic storage upon release of and final movement for access to the binder relative to the support in a substantially off-vertical plane, connected to the substantially off-horizontal plane movement enabling means.

REISSUES

APRIL 24, 1990

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

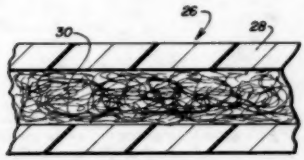
Re. 33,202
ENERGY TRANSMISSION DEVICE

Florian B. Janoski, Allentown, Pa., assignor to Atlas Powder Company, Dallas, Tex.

Original No. 4,290,366, dated Sep. 22, 1981, Ser. No. 57,898, Jul. 16, 1979. Application for reissue Jul. 15, 1985, Ser. No. 754,727

Int. Cl.[5] **F42B** *3/10*

U.S. Cl. 102—202.3 **29 Claims**



1. An energy transmission device for transmitting an explosive signal from an initiator to a receptor comprising:

(a) an elongated tube; and

(b) a self-oxidizing material loosely contained within said tube and extending substantially along the length of said tube for propagating an explosive signal through said tube, *said self-oxidizing material having a detonation rate of at least about 4,000 ft. per second when contained in said tube.*

Re. 33,203
GOLF BAG DEVICE

Eric W. Reimers, 235 N. First St., Missoula, Mont. 59802

Original No. 4,685,561, dated Aug. 11, 1987, Ser. No. 783,767, Oct. 3, 1985. Application for reissue Apr. 10, 1989, Ser. No. 336,018

Int. Cl.[5] **A63B** *55/00, 55/06*

U.S. Cl. 206—315.5 **27 Claims**

18. A golf bag device, comprising:

a bag portion in which the clubs and other equipment are stored, the bag portion having a closed end and an open end and being enclosed to form a generally tubular element, the bag portion including a rigid collar situated at said open end, a rigid base situated at said closed end exterior enclosing means adapted to extend between said collar and said base to separate the interior from the exterior of the bag portion; and

carrying means attached to the bag portion by which the bag device may be lifted and transported;

wherein the bag portion is characterized by having a longitudinal cross-section in the nature of a parallelogram, with said base and said collar forming lower and upper surfaces, respectively, which are parallel to a setting surface when the bag portion is in a rest mode, the rest mode being when the bag portion is placed upon such a setting surface such that said lower surface of said base abut thereagainst, and the side edges of said parallelogram, formed by the enclosing means, are offset from vertical in said rest mode defining an angle of incline for the bag device.

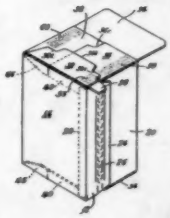
Re. 33,204
CARTON FOR PACKAGING ICE CREAM OR LIKE FROZEN INITIALLY LIQUID OR SEMI-SOLID MATERIAL

Thomas W. Froom, Pittsford, N.Y., assignor to Rolph-Clark-Stone Packaging Corporation, Newport News, Va.

Original No. 4,555,027, dated Nov. 26, 1985, Ser. No. 533,454, Sep. 19, 1983. Application for reissue Nov. 25, 1987, Ser. No. 126,257

Int. Cl.[5] **B65D** *5/54*

U.S. Cl. 206—626 **20 Claims**



15. A carton for ice cream or the like, comprising:

(a) a rectilinear carton body comprising cover, rear, bottom, front and front cover panels interconnected in the order named and at least a portion of said front cover panel is adhesively secured to said front panel and said cover panel is articulatable relative to said rear panel, each of said panels has first and second sides;

(b) an end wall forming flap extends from each of said rear, bottom and front panel sides, said end wall forming flaps are facially disposed and adhesively interconnected and form first and second end walls;

(c) a cover flap extends from said cover panel sides and each cover flap has a portion thereof releasably secured between the end wall forming flaps of an associated end wall;

(d) means operably connect each side of said front cover panel with the adjacent cover flap;

(e) end lips extend from each of said end walls, each end lip underlies and contacts the underside of said cover panel without being adhesively secured thereto;

(f) a front lip extends from said front panel and underlies and contacts the underside of said cover panel without being adhesively secured thereto; and,

(g) said lips have cooperatively shaped adjacent end portions so that an end portion of one lip abuts an end portion of an adjacent lip and thereby provides extended surface-to-surface contact with said cover panel.

Re. 33,205

LINEAR ANALOG LIGHT-LEVEL MONITORING SYSTEM HAVING SHORT LEADS TO REDUCE ELECTRONIC NOISE

Frederick H. Blake, Mill Creek, Wash., assignor to Multipoint Control Systems, Inc., Mill Creek, Wash.

Original No. 4,647,763, dated Mar. 3, 1987, Ser. No. 614,129, May 25, 1984. Application for reissue Apr. 22, 1988, Ser. No. 185,099

Int. Cl.[5] H01J 40/14

U.S. Cl. 250—214 AL 24 Claims

1. A system for remote monitoring of light levels, comprising:

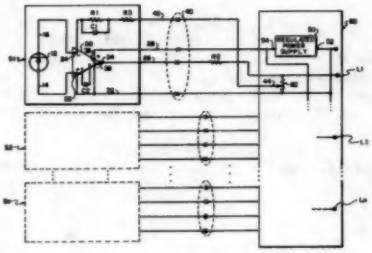
at least one sensor unit each remotely located from a central location, each sensor unit comprising:

(a) sensor means for sensing the level of light at a remote location and for providing a sensor signal linearly proportional to the sensed level of light;

(b) isolation means responsive to said sensor signal for isolating said sensor signal from electrical noise and for providing a noise-free output signal proportional to said sensor signal, said isolation means including feedback means for establishing the ratio of said output signal to said sensor signal; and

a control unit located at said central location comprising:

(a) at least one interconnect means, each for receiving a corresponding sensor unit output signal and for providing the received output signal from said control unit; and



(b) at least one calibration means each coupled to a corresponding sensor unit feedback means for modifying the ratio of the output signal to the sensor signal of the corresponding sensor unit.

PLANT PATENTS

GRANTED APRIL 24, 1990

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,222
MAGNIFICENT MAGENTA MAPLE

Melvin L. Schmidt, P.O. Box 246, Wathena, Kans. 66090, assignor to Melvin L. Schmidt and Kathleen A. Schmidt, both of Wathena, Kans.

Filed Sep. 6, 1988, Ser. No. 241,054
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—51 **1 Claim**

1. A new and unique variety of red maple, *Acer rubrum*, as described and illustrated, being particularly distinguished as to novelty by a combination of the shape of the tree which exhibits a desirable well-shaped, compact, symmetrical oval crown in contrast to the species which is often loosely shaped and much less compact, and a brillant, true magenta fall leaf color quite unlike that of other members of the species and any patented variety; the vivid magenta exhibited during most of the fall leaf color period dictates the name I have chosen for this tree: 'Magnificent Magenta Maple.'

7,223
IRIS PLANT NAMED PARIS

Joseph P. van Eijk, Ve Bennekom, Netherlands, assignor to H. J. A. Rooyakkers B.V. and World Flower B.V., both of, Netherlands

Filed Apr. 10, 1989, Ser. No. 336,020
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of iris plant named Paris, as illustrated and described.

PATENTS

GRANTED APR. 24, 1990

ERRATA

For CLASS	See PATENT NO.
148-016	4,918,806
033-001	4,918,817
029-596	4,918,830
029-598	4,918,832
029-606	4,918,833
029-621	4,918,834
029-722	4,918,835
029-732	4,918,846
384-015	4,918,862
051-105	4,918,956
070-276	4,918,968
073-040	4,919,007
474-072	4,919,008
475-234	4,919,009
475-044	4,919,010
475-281	4,919,011
475-183	4,919,024
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126-041	4,919,116
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165-010	4,919,245
211-041	4,919,287
305-003	4,919,492
433-006	4,919,612
055-417	4,919,710
423-658	4,919,716
204-098	4,919,791
424-450	4,920,016
434-198	4,920,033

435-007 4,920,063
264-003 4,920,079
544-316 4,920,134
526-247 4,920,170
530-385 4,920,194
534-016 4,920,195
530-351 4,920,196
525-409 4,920,203
536-124 4,920,207
435-235 4,920,209
549-214 4,920,212
346-134 4,920,258
368-242 4,920,365
360-068 4,920,461
360-078 4,920,462
364-521 4,920,514
361-385 4,920,574

PATENTS

GRANTED APRIL 24, 1990

GENERAL AND MECHANICAL

4,918,752

HELMET WITH DETACHABLE FRONT SECTION

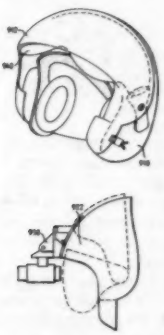
Michael Briggs, St. Albans, England, assignor to Helmet Limited, Moat Factory, Hertfordshire, England

Filed May 6, 1988, Ser. No. 191,060

Claims priority, application United Kingdom, May 8, 1987, 8710960

Int. Cl.[5] A42B *3/02*

U.S. Cl. 2—6 **6 Claims**



1. A helmet having a single rear part and two or more interchangeable front parts, the rear part comprising a shell shaped to extend at least partially over the top of the wearer's head and to each side of the head, each of the front parts accommodating a different piece of optical equipment, each front part being shaped to fit against the rear part to complete the shell of the helmet, and means for detachably connecting each front part to the rear part.

4,918,753

ADJUSTABLE FASTENING FOR SECURING GOGGLES TO A HELMET

Jean-Francois Mermillod, Saint-Jean-De-Sixt, France, assignor to Saer-Jmp, Bischheim, France

Filed Nov. 14, 1988, Ser. No. 270,004

Claims priority, application France, Nov. 13, 1987, 87 15724

Int. Cl.[5] A61F *9/02*

U.S. Cl. 2—10 **10 Claims**

1. A fastener for detachably securing a strap of a pair of goggles to the side of a motor-cyclist's helmet, said fastener comprising

a support for fixing to the helmet,

a fastener stud-piece for fixing detachably and reversibly to said support in first and second alternative positions,

and a buckle for attaching to an end of said strap and for cooperating with said stud-piece, whereby to secure said strap detachably to the helmet.

4,918,754

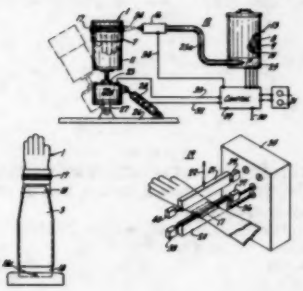
FLOCKED GLOVE AND PLASTIC SLEEVE MEMBER BONDED THERETO

Alfred F. Leatherman, and Clyde P. Repik, both of Columbus, Ohio, assignors to William C. Heller, Jr., Milwaukee, Wis.

Filed May 4, 1988, Ser. No. 190,150

Int. Cl.[5] A41D *13/08*

U.S. Cl. 2—16 **8 Claims**



6. A protective garment unit comprising a flocked glove of a rubber-like shell having a flocked lining, a plastic sleeve member having a cuff portion telescoped into said glove, a hot-melt adhesive band including a hot-melt adhesive resin and sub-micron particles interposed between said cuff portion and said glove, said particles generating heat in the presence of an RF magnetic field, and said adhesive band being intimately adhesively bonded to said rubber-like shell of said glove and said sleeve and forming a hermetic connection of said glove to said sleeve.

4,918,755

DISPOSABLE GLOVE OR MITT FOR SELF-SERVICE GASOLINE AND FROZEN FOOD HANDLER

Duane W. Kinnear, R.D. #1, 11770 Ridge Rd., East Springfield, Pa. 16411

Filed Sep. 30, 1988, Ser. No. 251,306

The portion of the term of this patent subsequent to May 30, 2005, has been disclaimed.

Int. Cl.[5] A41D *19/00*

U.S. Cl. 2—161 R **3 Claims**

1. A glove or mitt to be worn for self-service gasoline or for handling frozen food or for protecting emergency medical personnel, having a palm side of a flexible sheet of closed cell foamed plastic bubbles, the bubbles being of random sizes with the largest bubbles being of diameter about the thickness of the sheet and the medium sized and smaller bubbles being nestled together to fill the spaces between the larger bubbles and between the upper and lower surfaces of the sheet, and the

bubbles being filled with air or other gas, which provides a cushioned gripping surface and thermal insulation for pumping

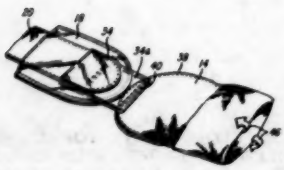
gasoline and for handling frozen foods and for providing cold weather protection for emergency medical personnel.

4,918,756

WATERPROOF FIREFIGHTER'S GLOVE

William L. Grilliot, and Mary I. Grilliot, both of 1986 Home Ave., Dayton, Ohio 45417

Filed Nov. 30, 1988, Ser. No. 278,214
Int. Cl.[5] A41D *19/00*
U.S. Cl. 2—164 **24 Claims**



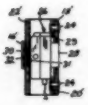
6. A firefighter's waterproof glove comprising an outer layer of abrasion resistant material, an intermediate layer of waterproof material, and an inner layer of thermal barrier material, stitching means extending through the intermediate layer and through the inner layer and attaching together the intermediate layer and the inner layer, sealing means sealingly attached to the intermediate layer and covering the stitching means, and securing means attaching the sealing means to the outer layer, whereby the layers are secured in desired relative positions as a firefighter's hand enters and withdraws from the inner layer of the glove and whereby the intermediate layer is maintained as a waterproof barrier as water is prevented from passage through the stitching means.

4,918,757

HEARING AID HEADBAND SUPPORT

Gwen V. Janssen, 837 N.W. 10, Oklahoma City, Okla. 73106, and Roy C. Rowland, 603 Sunnybrook, Edmond, Okla. 73034

Filed Jan. 30, 1989, Ser. No. 303,435
Int. Cl.[5] A42B *1/00*; G02C *11/06*
U.S. Cl. 2—171 **4 Claims**



1. A hearing aid support, comprising:

an elongated flexible headband having a length capable of surrounding a user's head from the forehead hairline across the position of the mastoid bones to the nape of the neck in end overlapping relation and having a width selected in accordance with the dimensions of a hearing aid to be supported;

means including a tube or patch strip securing a bone conduction oscillator or air receiver hearing aid to said headband in a manner for contact between the oscillator and the user's skull bone,

said headband having a plurality of longitudinal parallel spaced-apart slits at the position of the mastoid bone forming a lateral strip on either side of a center strip,

the tube being resilient, flexible and coextensive with the headband width and transversely threaded through the headband slits and gripped by the strips; and,

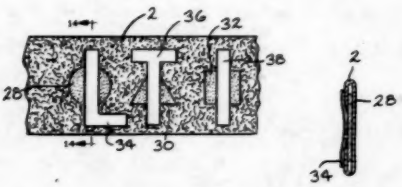
a hearing aid unit within the bore of said tube.

4,918,758

CHANGEABLE MESSAGE STRETCH BAND

Joseph R. Rendina, 1554 River View St., Monroe, Mich. 48161

Continuation of Ser. No. 143,035, Jan. 12, 1988, abandoned. This application Feb. 27, 1989, Ser. No. 316,598
Int. Cl.[5] A42B *1/24*
U.S. Cl. 2—171 **3 Claims**



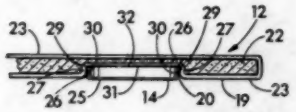
1. A tubular stretch band comprising a preferred inside surface and a preferred outside surface and interior surfaces, and further comprising at least one opening in the said outside surface, and further comprising a first material, having a plurality of loops, in communication with the said interior surfaces and the said opening, whereby the said loops on the said first material are exposed within the said opening to preferentially receive at least one graphic comprising a second material, having a plurality of hooks, wherein said second material is removably attached to the said first material by the user of the said band to enable the user of the said band to communicate changeable messages.

4,918,759

TIMEKEEPING CAP

Ernest R. Anderson, 5810 Leanne La., McFarland, Wis. 53538, and John K. Gahan, 5812 Glenway St., McFarland, Wis. 53558

Filed Dec. 20, 1988, Ser. No. 287,494
Int. Cl.[5] A42B 1/02
U.S. Cl. 2—199 7 Claims



2. A timekeeping cap comprising:

(a) a crown portion which may be placed and worn on a human head;

(b) a visor portion which extends from the crown portion for shade, the visor portion including a lower surface, a relatively stiff core and a layer of material substantially covering the core, and having a cavity which opens to the lower surface; and

(c) a clock which is positioned substantially within the cavity and which includes a clockface through which time may be viewed, and near peripheral portions of the cavity the layer of material forms flaps which extend at least partially into the cavity between the clock and core, wherein the layer of material includes hem portions overlying peripheral portions of the cavity and clockface, said hem portions being formed by the layer of material being folded back onto itself and being attached together.

4,918,760

FIREFIGHTER'S TROUSERS CAPABLE OF RECEIVING A BOOTED FOOT

William L. Grilliot, and Mary I. Grilliot, both of 1986 Home Avenue, Dayton, Ohio 45417

Continuation-in-part of Ser. No. 182,399, Apr. 18, 1988, Pat. No. 4,817,211. This application Mar. 29, 1989, Ser. No. 330,125
The portion of the term of this patent subsequent to Apr. 4, 2006, has been disclaimed.
Int. Cl.[5] A41D 13/00
U.S. Cl. 2—227 8 Claims

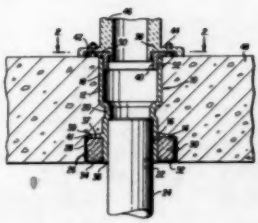
1. A firefighter's trousers which are easily donned by a firefighter who wears boots, in which each of the boots has a foot part and a leg part, the foot part and the leg part of each of the boots having given dimensions, the trousers comprising an outer shell of abrasion resistant material and an inner liner of insulation material, the inner liner being covered by the outer shell, the outer shell having a torso part and a pair of leg parts, the inner liner having a torso part and a pair of leg parts, each of the leg parts of the outer shell and each of the leg parts of the inner liner of the trousers having a lower portion which is adapted to cover the leg part of a firefighter's boot, the leg parts of the inner liner being tubular and forming a tubular passage significantly greater in dimensions than the given dimensions of the foot part and leg part of the boots, the leg parts of the outer shell freely encompassing the respective leg part of the inner liner whereby the boots move easily through the leg parts of the trousers as a firefighter dons the trousers while wearing the boots, the lower portion of each of the leg parts of the outer shell having a bottom edge, the lower portion of each of the leg parts of the inner liner having a bottom edge, the bottom edge of the lower portion of the leg parts of the outer shell and the bottom edge of the leg parts of the inner liner being immediately above the foot parts of the boots as the boots and trousers are worn by the firefighter, wherein the lower portion of the leg parts of the inner liner and the lower portion of the leg parts of the outer shell cover the leg parts of the boots, and whereby the legs of the firefighter are adequately protected while permitting ease of donning of the trousers while the firefighter wears boots, each of the leg parts of the outer shell including two separate sections which extend upwardly from the bottom edge of the leg part of the outer shell, the sections extending substantially the entire length of the leg parts, fastener means carried by the sections of each of the leg parts of the outer shell for attaching together the two sections of the leg parts of the outer shell, whereby the sections of the leg parts of the outer shell are attached together after the trousers are donned, the leg parts of the outer shell forming a tubular passage having a dimension only slightly greater than the given dimension of the leg part of the boots when the sections of the lower portion of the leg parts of the outer shell are attached together, whereby the lower portion of the leg parts of the outer shell closely enclose the lower portion of the leg parts of the inner liner, and whereby folds are formed in the lower portion of the leg parts of the inner liner as the lower portion of the leg parts of the inner liner closely covers the leg part of the boots.

4,918,761

METHOD OF USING A TOILET-FLANGE CAST-IN MOUNT

Gerold J. Harbeke, 2807 S. Military Trail, West Palm Beach, Fla. 33415

Filed Jun. 2, 1988, Ser. No. 201,147
Int. Cl.[5] E03D 11/16
U.S. Cl. 4—252 R 6 Claims



1. A method of installing a toilet flange in a building, said method comprising the steps of:

casting a one-piece, tubularly-shaped mount having a bottom end portion with an inside diameter of the size and shape of a female coupling for three inch pipe and a top end portion with an inside diameter of four inch pipe, said bottom end portion defining approximately a three and one half inch internal diameter bottom opening for receiving a three inch pipe and said top end portion defining approximately a four inch internal diameter top opening for receiving a four inch external diameter tubularly-shaped stub of a toilet-flange therein, said top end portion being substantially longer than said bottom end portion and being of such a length as to make the overall length of said mount greater than the thickness of a concrete floor in which said mount is to be embedded;

attaching said mount to a form for casting said concrete floor with said bottom end portion being adjacent said form;

casting a concrete floor in said form about said mount with the bottom opening exposed on the bottom of the floor and with the top opening exposed on the top of the floor;

cutting off said top end portion a sufficient amount so that said mount has a length corresponding to a thickness of the cast concrete floor;

inserting a three inch pipe into a bottom opening and affixing it to the bottom-end portion and inserting a tubularly shaped stub of a toilet-flange into the top opening, said tubularly-shaped stub having approximately a four inch external diameter of substantial length matching the internal diameter of said top end portion; and

wrapping an intumescent-material collar for closing off three inch pipe in a three inch female coupler about the bottom end portion at a bottom end thereof and casting it into said concrete floor with said mount for expanding and thereby closing off said bottom end portion and the three inch pipe mounted therein when it is exposed to the heat of a fire.

4,918,762

DOUBLE-URINAL FLUSHING APPARATUS AND METHOD FOR AUTOMATIC OPERATION

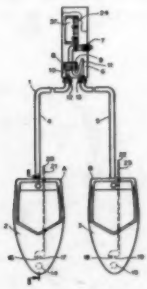
Fritz Uhlmann, Niederwichtrach, Switzerland, assignor to Bieri Pumpenbau AG, Munsingen, Switzerland

Continuation of Ser. No. 168,154, Mar. 15, 1988, Pat. No. 4,815,150. This application Nov. 21, 1988, Ser. No. 273,832

Claims priority, application Switzerland, Mar. 17, 1987, 00997/87

Int. Cl.[5] E03D *13/00*

U.S. Cl. 4—303 **4 Claims**



1. In a urinal installation of the type having two urinals connected to two water supply lines connected to a main water supply line, a solenoid valve connected in each of said two water supply lines for flushing said urinals, each urinal having a siphon with two electrodes respectively disposed in each of said siphons, an electronic control device for measuring the conductivity of flushing water in said siphons, electronic control means responsive to said electrodes for activating said solenoid valves for flushing said urinals, wherein the improvement comprises:

said main water supply line being of a size sufficient for flushing a single urinal and, said control means having first means for deactivating one of said solenoid valves when the other is activated for flushing one of said two urinals, whereby said urinals can be flushed using a main water supply line designed for a single urinal.

4,918,763

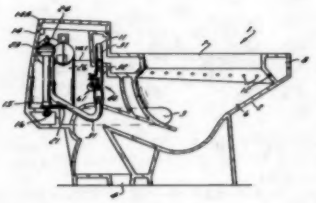
WATER CLOSET WITH SUPPLEMENTED RIM WASH WATER FLOW

John J. Brotcke, Germantown, Wis., assignor to Canaceramic Limited, Tortola, British Virgin Isls.

Filed Jan. 23, 1989, Ser. No. 300,047

Int. Cl.[5] E03D *1/24*

U.S. Cl. 4—331 **4 Claims**



1. A water closet (1) comprising:

a bowl (2) which includes an opening (3) for admitting flush water, a water and waste discharge (4), and sides (6) terminating in a bowl rim (7) having a water conveying passage (8) therein, a rim water inlet (11) into said passage and rim water outlet means (12) from said passage for washing said bowl sides;

a tank means (14) for storing flush water at a full first level (WL1) whereat a substantial volume of said water will not flow by gravity into said rim and having a water inlet (15) for connection to a supply of water (16) under pressure and a flush water outlet (21) connected to said bowl flush water admitting opening;

a water inlet valve means (23) mounted in flow control relation to said water inlet and movable between water inlet open and closed positions by a first water level sensing means (24) in response to the water level in said tank;

a flush valve means (26) mounted in said tank and manually movable to an open position to permit discharge of water from said tank into said bowl and automatically movably by a flush valve closing means to a closed position after said water level in said tank drops;

a rim water supply conduit means (31) including a longitudinal flow path, said conduit means connected in flow communication between said water inlet valve means and said rim water inlet;

a flow control valve means (32) having a valve element mounted in said conduit movable between conduit open and closed positions;

a tank water withdrawing means (40) including a high suction zone (42) below said rim inlet having an output (43) in fluid communication with said rim inlet and an aperture means (51) connecting said zone in fluid communication with said tank, said withdrawing means being automatically operative only when water is flowing through said rim passage during flushing to cause a portion of the water stored in said tank to be withdrawn for flow upward into said rim inlet during flushing so that stored tank water will supplement the volume of water flowing from said water inlet to said rim passage; and

a second water level sensing means (61) including a float element having an adjustable connection to said valve element to move the latter between said conduit open and closed positions, said adjustable connection permitting the position of said float element to be regulated relative to the position of said valve element to cause said flow control valve means

to be in said open position when said tank water level is at said first level and remains in said open position when said water level is falling to an intermediate level (INT) below said first level to permit water from said water

inlet valve means, when open, to immediately flow through said conduit to said rim inlet; and

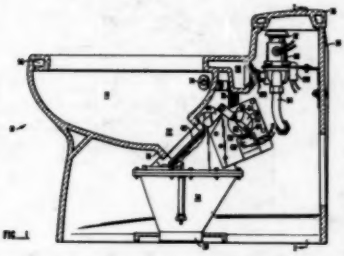
to move to said closed position when said tank water level drops below said intermediate level to a second level and remains in said closed position when said water level is rising from said second level to said first level to enable flow to said rim passage to be stopped at any desired time after minimum rim wash requirements have been met to minimize the amount of water used for rim wash, and then cause water flowing from said water inlet to flow through said aperture means to refill said tank.

4,918,764

ELECTRICALLY OPERATED TOILET

Vernon W. Hasselswerdt, Willits, and John M. Mayfield, Jr., Ukiah, both of Calif., assignors to Microphor, Inc., Willits, Calif.

Filed Jun. 13, 1988, Ser. No. 206,251
Int. Cl.[5] E03D 5/10
U.S. Cl. 4—406 **12 Claims**



1. An electrically operated toilet comprising:

water receiving means for receiving pressurized water;

a toilet bowl in fluid communication with the water receiving means, the toilet bowl having a discharge opening for flowing waste material therefrom;

an electrically operated water valve, coupled to the water receiving means, for selectively allowing water to flow into the toilet bowl;

an electrically operated waste valve, coupled to the toilet bowl, for selectively allowing waste material to flow through the discharge opening, the waste valve including a cover for covering the discharge opening; and

control means, coupled to the water valve and to the waste valve, for operating the water valve and the waste valve so that water is allowed to flow into the toilet and subsequently out of the discharge opening, the control means comprising:

a first switch for selectively activating the water valve;

a motor;

linkage means, coupled to the motor and to the cover, for moving the cover for selectively uncovering the discharge opening when the motor is activated;

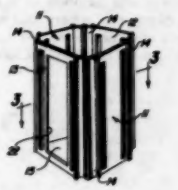
switch activating means, disposed in close proximity to the first switch, for causing the first switch to activate the water valve when the motor is activated, the switch activating means including a cam mounted on the motor, the cam rotating when the motor is activated, and the cam having a lobe which selectively contacts the first switch.

4,918,765

PORTABLE TOILET CABANA

George W. Harding, Clearwater, Fla., assignor to Poly-John Enterprises Corp., Whiting, Ind.

Continuation of Ser. No. 85,188, Aug. 14, 1987. This application Mar. 1, 1989, Ser. No. 317,547
Int. Cl.[5] A47K 11/02
U.S. Cl. 4—460 **12 Claims**



1. A portable toilet-type cabana comprising:

four vertically arranged, generally flat, wide walls arranged at right angles to each other and made of relatively resilient, thin plastic sheet material, with each of the vertical side edges of the walls being bent into an integral, narrow edge flange extending outwardly of the plane of the respective wall, and the adjacent side edges of the wall being spaced apart;

a generally flat, narrow corner panel formed of thin plastic sheet material and being of about the same height as the walls, extending between each pair of adjacent spaced apart wall side edges at an obtuse angle relative to their respective walls for interconnecting the adjacent wall side edges for forming an octagon-like enclosure with alternating wide and narrow sides, the width of the corner panels being roughly in the range of about a quarter of the width of the walls;

the vertical side edges of the panels being bent into integral, narrow edge flanges extending outwardly of the plane of their respective panels and outwardly of the enclosure, and arranged in contact with an adjacent wall side edge flange;

and fastening means securing the adjacent contacting flanges together to provide a column-like strip extending the height of the walls at the opposite sides of the narrow sides defining the octagon-like enclosure for reinforcing and rigidifying the enclosure.

4,918,766

HYROTHERAPY EXERCISING DEVICE WITH SCISSOR LIFT TREADMILL

Angelo Leonaggeo, Jr., 7 High St., Bedford Hills, N.Y. 10507

Filed Oct. 16, 1984, Ser. No. 661,344
Int. Cl.[5] E04H 3/18
U.S. Cl. 4—495 **9 Claims**

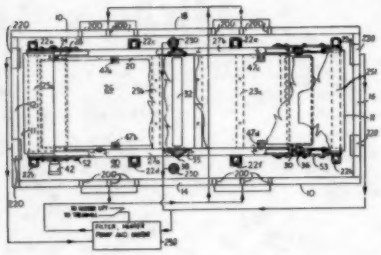
1. Apparatus for exercising and massaging a person, a horse or any animal comprising:

(a) a tank for containing a pool of water having a bottom wall and upstanding sidewalls and end walls:

(b) a cage for supporting the person, horse or other animal in said tank;

(c) a treadmill means forming the cage bottom;

(d) means for driving said treadmill means;
(e) a scissor lift device for raising and lifting the cage and treadmill means, said scissor lift device including two parallel upper pairs of arm members and tow parallel lower pairs, each of said arm members having an upper end and a lower end, the upper end of each of said upper arm members being pivotably connected to said treadmill means, the lower end of each of said upper arm members being pivotably connected to a respective one of the upper ends of said lower arm members so as to create a first and a second axis of rotation where said upper arm members meet said lower arm members, said upper and said lower arm pairs being operable in tandem, said lift device further



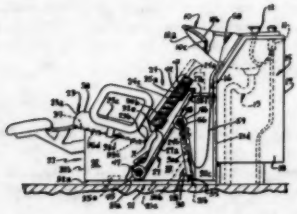
including a stabilizer bar provided so as to span between said parallel tandem arm pairs at the first axis of rotation where said upper arms meet said lower arms;
(f) means for powering the scissor lift device, said scissor lift powering means being connected to said scissor lift device in the area of the second axis of rotation;
(g) a plurality of spaced output nozzles in the said tank walls;
(h) means for injecting water into the pool under pressure through said nozzles to provide turbulence in the pool for massaging portions of the body situated in said tank between said tank;
(i) a filtration system for cleaning and purifying the tank water; and
(j) means for powering the filtration system.

4,918,767

SHAMPOO CHAIR AND BOWL APPARATUS

Gary M. Benting, Rockford, Ill., assignor to Smith Investment Company, Belvidere, Ill.

Filed May 30, 1989, Ser. No. 357,907
Int. Cl.[5] A45D *19/00, 44/10*
U.S. Cl. 4—517 **12 Claims**



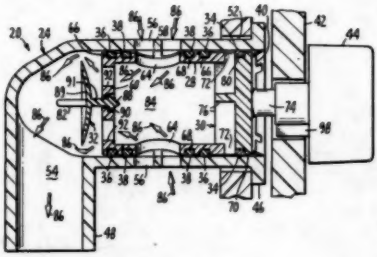
1. A shampoo chair and bowl apparatus comprising, a shampoo bowl having water supply and drain fittings, a front side, a neck receiving depression in the front side defining an upwardly and forwardly facing neck rest at the bottom of the depression, and means mounting the shampoo bowl with the neck rest at a selected elevation above a floor, a shampoo chair including a stationary base adapted to rest on a floor at the front side of the shampoo bowl, a movable chair frame and a seat and a back rest fixed to the frame for movement as a unit therewith, guide means mounting the chair frame on the base for movement along a linear guide path inclined upwardly and rearwardly at a preselected angle toward the shampoo bowl between a lower and an upper position, the chair frame and guide means being constructed and arranged to support and guide the chair frame during movement along said guide path with the back rest extending upwardly and rearwardly from the seat generally parallel to said guide path toward the neck rest on the shampoo bowl, and selectively operable means for positioning the chair frame in different adjusted positions between said raised and lowered positions.

4,918,768

AIR VALVE FOR SPAS AND BATHS

Daniel A. DeSousa, Clayton; William G. Badley, Antioch, and Ralph D'Innocente, Pittsburg, all of Calif., assignors to Jacuzzi Whirlpool Bath, Walnut Creek, Calif.

Filed Nov. 18, 1987, Ser. No. 122,051
Int. Cl.[5] A61H *33/02*
U.S. Cl. 4—542 **15 Claims**



1. An air valve for controlling the supply of air to a venturi jet of a spa, wherein the spa includes an air supply pip that fluidically connects the air valve to the venturi jet, the valve comprising:
a housing adapted for mounting on a side wall of the spa, wherein the housing has an interior chamber extending between first and second ends, wherein a portion of the interior chamber adjacent the first end thereof is an open, cylindrical bore, wherein the housing includes a pipe coupling for fluidically connecting the second end of the interior chamber to the air supply pipe, and wherein the housing includes a housing port extending between the cylindrical bore and the exterior of the housing;
a cylindrical barrel rotatable within the cylindrical bore of the housing, wherein the barrel is adapted for insertion into the cylindrical bore through the open end of the bore, wherein the barrel includes an interior cavity having a first end that is fluidically sealed and is positioned adjacent the open end of the cylindrical bore and a second end that is fluidically open to the interior chamber of the housing, wherein the barrel includes a barrel port extending through the wall of the barrel between the cavity and the exterior of the barrel, and wherein the barrel port is longitudinally positioned such that the barrel and housing ports can overlap;
retaining means for retaining the barrel within the cylindrical bore of the housing, said retaining means including a protrusion within the interior chamber of the housing that limits the maximum insertion of the barrel into the cylindrical bore, and including a retaining ring that engages the inner wall of the cylindrical bore and retains the barrel between the retaining ring and the protrusion;

sealing means for sealing between the cylindrical outer surface of the barrel and the cylindrical bore of the housing to prevent air from flowing between the exterior and interior of the housing except when the housing and barrel ports overlap; and

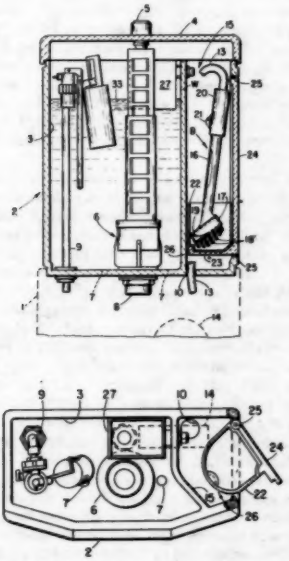
means for rotating the barrel between an open position wherein the housing and barrel ports are aligned and a closed position wherein the housing and barrel ports do not overlap and are fluidically isolated by the sealing means.

4,918,769

FLUSH TANK FOR A WATER CLOSET HAVING SELF CONTAINED WASHING MEANS

Luigi Gandini, Cernusco Lombardone, Italy, assignor to American Standard Inc., New York, N.Y.

Filed Apr. 10, 1989, Ser. No. 335,256
Int. Cl.[5] A47K 17/00; E03C 00/00
U.S. Cl. 4—661 **6 Claims**



1. A flush tank assembly which is adapted to be mounted in fluid commnication with the flush water inlet opening of a toilet bowl comprising:

a flush tank having a vertically extending partition wall positioned between the two vertical side walls of said tank to form a first chamber which houses a water control and flush valve assembly and is adapted to discharge flush water into the toilet bowl, and a second chamber which houses a removably mounted washing means;

said washing means including a manually-operated valve means operatively coupled to said washing means to control the flow of wash water therethrough;

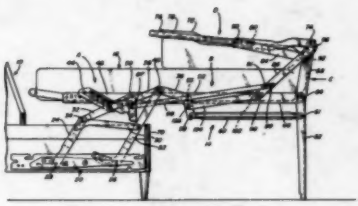
and a flexible conduit coupled between said water inlet source and said washing means so that when said washing means is removed from said second chamber, wash water is manually regulated through said washing means to cleanse the toilet bowl as needed.

4,918,770

SOFA BED WITH CLOSING AND OPENING ASSIST

Michael F. Hartline, Saltillo, and Nikki O. White, Tupelo, both of Miss., assignors to Super Sagless Corp., Tupelo, Miss.

Filed Nov. 21, 1988, Ser. No. 281,182
Int. Cl.[5] A47C 17/04
U.S. Cl. 5—13 **5 Claims**



1. A sofa bed frame supporting a mattress and movable between a closed or sofa configuration, a partially open configuration and a fully open or bed configuration comprising

a main angle and a rear leg for supporting the front end of the main angle when the frame is in the bed configuration,

a center angle pivotally connected at one end to the front end of the main angle, said center angle being coplanar with the main angle when the frame is in the bed configuration and substantially perpendicular to the main angle when the frame is in the sofa configuration,

a front tube pivotally connected to the other end of the center angle and being generally coplanar with the main and center angles when the frame is in the bed configuration and lying in a plane substantially parallel to and spaced above the main angle when the frame is in the sofa configuration,

a front leg pivotally connected to the front tube for supporting the front tube when the frame is in the bed configuration,

a front leg lock link pivotally connected intermediate its ends to the center angle and pivotally connected at one end to the front leg,

a rear leg control link pivotally connected at one end to the rear leg,

a lock link pivotally connected at one end to the other end of the front leg lock link and slidably connected at its other end to the main angle,

a pull link pivotally connected at one end to the other end of the lock link,

and actuating means including a crank directly connected to the pull link and the rear leg control link and responsive to the frame being moved from the closed to the partially open configuration for causing the pull link to pivot the front tube upwardly slightly on the center angle so as to relieve pressure on the mattress folded between the main angle and the front tube and also for causing the rear leg control link to lower the rear leg to a position to support the front end of the main frame, responsive to the frame being moved from the partially open to the closed configuration for causing the pull link to pivot the front tube downwardly toward the main angle so as to compress the mattress folded between them and also for causing the rear leg control link to raise the rear leg to a stored position.

4,918,771

PATIENT LIFTING AND HOIST THEREFOR

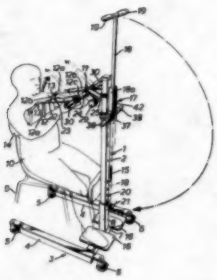
David R. James, Glenyard, England, assignor to James Industries Limited, Gloucester, England

Filed May 30, 1984, Ser. No. 615,305

Claims priority, application United Kingdom, Jun. 2, 1983, 8315121

Int. Cl.[5] **A61G** *7/10*

U.S. Cl. 5—81 R **27 Claims**



11. An invalid host for lifting a seated invalid to a standing position comprising an upstanding support structure, a pivotal lifting arm arrangement projecting from one side of said support structure and providing laterally spaced attachment points for the attachment of a padded body support sling passed around the back of the invalid below the arms thereof with the attachment points rigidly located laterally of an arm arrangement which is pivotal about a fixed horizontal axis with the attachment points disposed at a radius comparable to the average length of a human thigh bone, knee location abutment means on the support structure, foot support means mounted on said support structure and a lifting mechanism operative to raise the lifting arm arrangement about said horizontal pivot axis through an angle sufficient to raise the patient, with the knees of the latter located against said abutment means, to the standing position on the foot support means while supported from behind and laterally located by the sling.

4,918,772

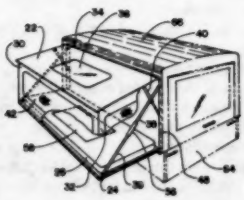
FOLDING SLEEPER SHELL

Hudson C. Haile, 1881 Fosse Way, Titusville, Fla. 32796

Filed Sep. 7, 1988, Ser. No. 241,908

Int. Cl.[5] **B60R** *15/00*

U.S. Cl. 5—119 **2 Claims**



1. A folding sleeping assembly for humans including a rectangular rigid frame, a rigid rectangular bed member, a rigid rectangular roof member, and having three rectangular flexible side walls of water resistant fabric, the assembly being suitable for mounting in the side of a vehicle element such as a pickup truck topper, van body, or mobile or motor home such that when installed the short dimension of said frame is approximately vertical, with said sleeping assembly comprising:

said rectangular rigid frame having an open area bordered by edges having a flanged cross section, said edges including relatively long top and bottom edges and relatively short side edges said roof member being rotatably hinged on one long edge to the long top edge of said frame, said rigid bed member being rotatably hinged on one long edge to the bottom edge of said frame, said side walls being formed by a substantially rectangular flexible water resistant fabric panel having one long edge attached to a periphery of said roof member except for said long edge of said roof member hinged to said frame, and another long edge of said water resistant fabric panel attached to said bed member's periphery except for said one long edge of said bed member hinged to said frame, such that

when said bed member is rotated upward about its hinged attachment to a vertical folded position against said frame, and said roof member is rotated downward about its hinged attachment to a vertical folded position, said sleeping assembly comprises a compact flat assembly in a stored configuration and,

when said roof member is rotated outward and upward approximately 90 degrees about its hinged attachment, and when said bed member is rotated outward and downward approximately 90 degrees about its hinged attachment, said flexible water resistant fabric panel is stretched between the members as to compirse three side walls of said sleeping assembly with a fourth side of said sleeping assembly open to the interior of a vehicle element to which said frame is attached, such that said sleeping assembly forms a deployed assembly in a use configuration and

when said sleeping assembly is deployed by rotating said roof member upwardly and said bed member downwardly the spring loaded cylinder at each end of said sleeping assembly hingedly connected at each end of said cylinder between said frame and said roof member such that the weight of said roof member is by said cylinders so as to minimize the effort of deployment, said bed member is counterbalanced by said cylinders through said side walls as to keep said flexible fabric taut, said cylinders facilitate rotation of the deployed sleeping assembly so that the bed member can be made level, and

when deployed, said bed member is fixed in the desired position by diagonal adjustable length bar assemblies located at each end of said sleeping assembly and which are suitable for loading either in tension or compression and which each said bar assembly is hingedly attached at each end between said frame and outer corners of said bed member and comprise a tension loaded element when said bed is carrying the load of one or more humans, and a compression element when said bed member is unloaded and said pneumatic spring loaded cylinders are attempting to lift said roof member and consequently lift said bed member through the attached side wall of said assembly, and which each said adjustable bar assembly is comprised of two long flat metal pieces with means for selectively connecting the metal pieces together at spaced locations forming a connection to provide overall length adjustment, and which said adjustable bar assembly connection is held in place by a metal tubular lock which slides down over said connection and is of sufficient length to hold said connection and said bar assembly in a rigid configuration.

4,918,773

POSTURIZED SPRING BEDDING PRODUCT

Terence A. Scott, Carthage, Mo., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

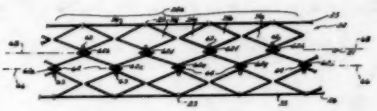
Filed Dec. 16, 1988, Ser. No. 285,778

Int. Cl.[5] **A47C** *27/07*

U.S. Cl. 5—252 **22 Claims**

9. A spring interior comprising a plurality of longitudinally

extending bands of springs disposed side by side and connected together in the top and bottom faces of the bands, each of said bands of springs comprising a single length of wire formed into a plurality of substantially vertical coil springs arranged in a row and interconnected by interconnecting segments of wire located alternately in the top and bottom faces of the bands, each of said interconnecting segments comprising a longitudinally extending bridging portion, each of the coil springs being interlaced with the adjacent coil springs of the same row, and



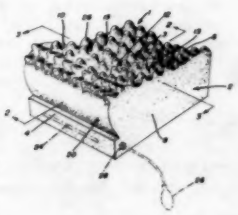
the spring interior being characterized by differing firmness of the coil springs throughout the length of the spring interior, said differing firmness being the result of posture rods extending through interlaced portions of a plurality of pairs of interlaced coils of the spring interior, each posture rod being located between said top and bottom faces of the bands.

4,918,774

MEDICAL SUPPORT PILLOW

Michael D. Popitz, Boston, Mass., assignor to Brigham and Women's Hospital, Boston, Mass.

Filed Aug. 16, 1989, Ser. No. 394,642
Int. Cl.[5] A47G 9/00
U.S. Cl. 5—441 **20 Claims**



1. A support pillow for supporting and maintaining the head and neck of a human in the sniffing position in which the neck is flexed upwards and the head is angled downwardly to achieve alignment of the airway axes, comprising:

a base, said base having an opposing neck end and head end, an opposing left side and right side, and a bottom surface;

a neck support, for supporting the neck, said neck support positioned at said neck end of said base;

a head support for supporting the head, said head support including a center head supporting surface which slopes downwardly from said neck support toward said head end;

said head support further including a left head supporting surface which slopes downwardly from said left side toward said center head supporting surface;

said head support further including a right head supporting surface which slopes downwardly from said right side toward said center head supporting surface; and

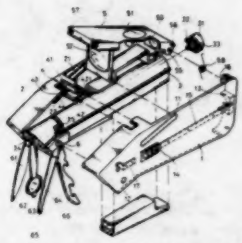
said head support and said neck support being dimensioned relative to each other to automatically align and maintain alignment of the oropharyngeal, the laryngeal and the tracheal airway axes of the human in the sniffing position when said head and neck are positioned upon said support pillow.

4,918,775

PORTABLE SAFETY DEVICE COMBINATION FOR OUTDOOR USE

Ching-Baiu Leu, 6F-1, No. 283, An-Ho Road, Taipei, Taiwan

Filed Dec. 21, 1988, Ser. No. 288,956
Int. Cl.[5] B25F 1/04
U.S. Cl. 7—168 **9 Claims**



1. A portable safety device for outdoor use comprising:

a first and a second shell;

two grooves respectively disposed in said first and second shells;

a switch disposed on said first shell and exposed to the outer environment of said first shell;

first and second conductive plates disposed on said first shell which electrically communicate with each other by said switch;

a cylindrical lighting means disposed between said first and second shells and one end thereof protruding from the combination of said first and second shells;

fixing means disposed on the other end of the combination of said first and second shells for connecting said lighting means, and said first and second shells together;

a telescope movably disposed upon said lighting means and having an open position and a closed position, said telescope having an object lens pivotally engaged thereto and an eye lens connected thereto;

a slidably elongated means provided on the object lens of said telescope for slidably moving said telescope from said closed position to said open position and two ends thereof respectively sliding on the grooves of said first and second shells;

engaging means disposed on one end of said telescope which is near the eye lens of said telescope for connecting said telescope with said first and second shells; and

a T-shaped block disposed near the other end of said telescope which is near the object lens of said telescope for releasing said telescope so that said telescope may move from said closed position to said open position;

whereby upon the movement of said T-shaped block, said telescope may move from said closed position to said open position.

4,918,776

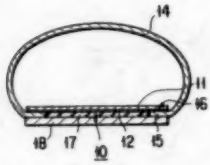
METHOD OF MANUFACTURING SHOES AND INSOLE PART

Shingo Motoda, Tokyo, Japan, assignor to Kabushiki Kaisha Tobi, Tokyo, Japan

Filed Oct. 12, 1988, Ser. No. 256,789
Claims priority, application Japan, Jul. 19, 1988, 63-179693
Int. Cl.[5] A43D 11/00
U.S. Cl. 12—142 F **3 Claims**

1. A method of manufacturing shoes comprising forming an insole part comprising the steps of: cementing a soft and thin insole sheet on a thick insole base having a rigidity and strength sufficient to withstand a lasting in such a way that the insole base may be easily peeled apart from the insole sheet, temporarily fixing the insole part on the bottom of a last with the

insole sheet directed outwardly, covering the last with an upper contacting the last tightly, lasting an end portion of the upper and superposing the end portion on a peripheral end portion of the insole part, cementing the end portion of the upper and the peripheral portion of the insole part, releasing



the temporary fixing of the insole part, superposing an outsole on the insole part and the end portion of the upper, cementing the outsole to the end portion of the upper, pulling out the last, and removing at least a part of the insole base from the insole part by peeling the insole base apart from the insole sheet.

4,918,777

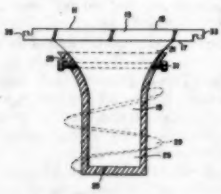
SLAB-STEM UNIT FORMING A TRAFFICWAY

Eddie L. Ashley, 3616 Ferry Ave., Niagara Falls, N.Y. 14302

Continuation of Ser. No. 129,534, Dec. 7, 1987, abandoned. This application Mar. 31, 1989, Ser. No. 331,688

Int. Cl.[5] E01D *15/12*

U.S. Cl. 14—73 **7 Claims**



1. A unitary construction element for use along with other similar elements to be assembled into a flat, horizontally disposed pedestrian traffic way, said elements adapted to be removeably secured to a site foundation, said structure comprised of a plurality of such elements disconnectively interlocked one with another to prevent substantial horizontal or vertical movement, said construction element comprising:

a. a unitary body, said body having an upper load bearing surface portion and a lower load supporting portion,

b. said upper portion comprised of a rectangular slab having substantially flat top and bottom surfaces, said bottom surface in touch contact with said site foundation,

c. said lower portion comprised of at least one integral support stem perpendicularly attached to said bottom surface of said slab, the bottom portion of said support stem, or stems, positioned in support contact with a site foundation separate anchor boot,

d. said support stem, or stems, having a substantially uniform cross-section along the lower portions thereof to facilitate easy removal of the element from a site foundation, said stem, or stems, having outwardly flared upper portions positioned adjacent the junction of said stem, or stems, and said slab,

e. the ratio between the surface area atop said slab and the cumulative cross-sectional area of the lower, non-flared portions of said stem, or stems, being between about 4 to 1 and about 6 to 1.

f. including a separate anchor boot designed to be secured into said site foundation and to receive a substantial portion of said stem.

4,918,778

ENDLESS ROTARY BAND CLEANING DEVICE, PARTICULARLY FOR CLEANING A CONVEYOR BELT OR SUPPORTING SURFACES OF OBJECTS

Guillaume Chupin, Versailles, and Denis Dandeville, Mantes la Ville, both of France, assignors to VIFE, Versailles, France

Filed Oct. 14, 1988, Ser. No. 258,271

Claims priority, application France, Oct. 16, 1987, 87 14869

Int. Cl.[5] B08B *1/02*

U.S. Cl. 15—97 R **14 Claims**

1. An endless rotary band cleaning device, wherein the endless cleaning band is mounted on at least three rollers disposed parallel to each other, namely: two main rollers one at least of which is driven in rotation and a secondary roller disposed in the space between the two main rollers, these three rollers being adapted so that the cleaning band follows, in its upper part, a rectilinear path going from the first to the second main roller while forming a cleaning surface then, in its lower part, a sinuous path comprising two portions situated on each side of said secondary roller, namely:

(i) an upstream portion which extends between the second main roller and the secondary roller, in which the band follows an upgoing course in a first zone and is continuously subjected to a washing with a washing liquid, and

(ii) a downstream portion which extends between the secondary roller and the first main roller, and in which the band follows a downgoing course in a second zone and is impregnated with a cleaning liquid for carrying out said cleaning.

4,918,779

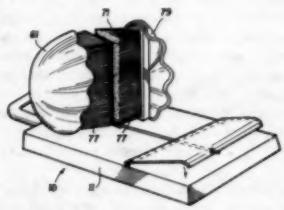
FOOT SPRAYING AND CLEANING DEVICE

Matt B. Burns, P.O. Box 958, Hanalei, Haena County, Hi. 96714

Filed Feb. 27, 1989, Ser. No. 315,807

Int. Cl.[5] A61H *33/00*; **A47K** *7/03*; **A46B** *11/06*

U.S. Cl. 15—104.92 **11 Claims**



1. An improved foot cleaning device, comprising:

(a) a base having a fluid piping system mounted thereon, said fluid piping system including an inlet and at least one outlet comprising an elongated spray bar having a plurality of outlet orifices therein, and valve means interposed between said inlet and said at least one outlet;

(b) an actuator for said valve means including a foot pedal on said base and linkage means connected between said foot

pedal and said valve means for transferring pedal movements into actuating movements of said valve means between respective open and closed positions; and

(c) said spray bar being embedded within a brush mounted on said base.

4,918,780

WIPER ARM ASSEMBLY FOR MOTOR VEHICLES

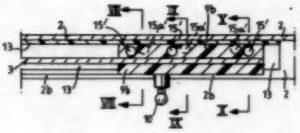
Marcello Scorsiroli, Turin, Italy, assignor to Champion Spark Plug Italiana S.P.A., Italy

Filed Aug. 5, 1988, Ser. No. 229,016

Claims priority, application Italy, Aug. 7, 1987, 67695 A/87

Int. Cl.[5] B60S 1/36

U.S. Cl. 15—250.21 **18 Claims**



1. A wiper arm assembly for motor vehicles or the like, comprising:

a mounting head rigidly secured to a drive shaft;

a channel coupled to said mounting head;

spring means coupled between said mounting head and said channel and biasing an outer end of said channel towards the surface to be wiped;

a sliding element located inside a portion of said channel spaced from said mounting head, said sliding element provided with an arm extension, said sliding element being connected to the vehicle body by means of a rod provided with an articulation at both of its ends; and

macroscopic, solid, antifriction means comprised of balls or rollers located between the outer walls of said sliding element and the inner walls of said channel portion, for reducing friction between said sliding element and said channel portion along a substantial length of said channel portion.

4,918,781

HAND VACUUM CLEANER

John F. Sovis, Coldwater, Mich.; Robert M. Smith, Copley, Ohio, and George H. Bramball, Boulder, Colo., assignors to Royal Appliance Mfg. Co., Cleveland, Ohio

Division of Ser. No. 153,971, Feb. 9, 1988, which is a continuation of Ser. No. 877,881, Jun. 24, 1986, Pat. No. 4,730,362, which is a division of Ser. No. 670,553, Nov. 9, 1984, Pat. No. 4,633,543. This application Mar. 31, 1989, Ser. No. 332,558

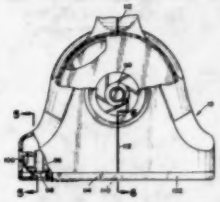
Int. Cl.[5] A47L 5/26

U.S. Cl. 15—392 **2 Claims**

1. A hand-held vacuum cleaner including a housing, a nozzle assembly and a rotating brush contained in the nozzle,

said nozzle assembly including a nozzle having integrally formed opposed bearing housing cavities, said cavities being sized to closely receive bearing housings of said rotating brush and having open ends to expose the bearing housings;

and a nozzle guard including bearing housing retaining



elements comprising clip elements received in the open ends and disposed for deflecting interference fit to the bearing housings whereby said brush is positively retained in the nozzle assembly to minimize vibrational movement.

4,918,782

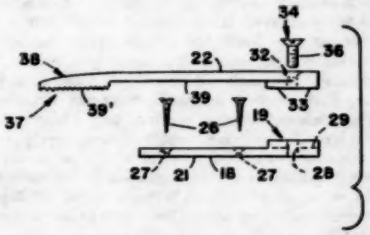
CARPET FASTENER

Bijan Zahedi, 1333 Grand Ave., Piedmont, Calif. 94610

Filed Feb. 21, 1989, Ser. No. 312,476

Int. Cl.[5] A47G 27/02

U.S. Cl. 16—11 **7 Claims**



1. A carpet fastener for securing a carpet to an underlying surface, comprising:

an anchor member for disposition against said underlying surface, said anchor member having a boss at one end and a relatively thin flat arm proportioned to extend therefrom under an adjacent region of said carpet, said anchor member having screw passages for enabling securing of said anchor member to said underlying surface and having a threaded passage in said boss,

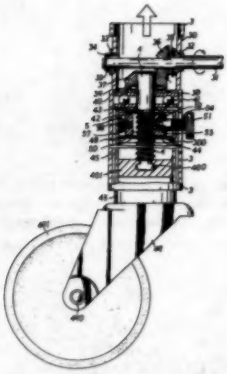
a carpet clamping member for disposition over said anchor member and said adjacent region of said carpet in substantially parallel relationship with said anchor member, said clamping member having a connector end for engagement with said anchor member at said boss thereof and having a passage in said connector end that aligns with said threaded passage of said boss, said clamping member further having an opposite end extending from said connector end with a flat pressure pad undersurface for exerting clamping pressure against said carpet, said clamping member having a length sufficient to position said pressure pad undersurface beyond the location of said arm of said anchor member, said clamping member being downwardly stepped at the junction between said pressure pad and the adjoining portion of said clamping member to locate said pressure pad undersurface at a lower level than said adjoining portion of said clamping member and wherein said pressure pad

4,918,783

ADJUSTABLE WHEEL STRUCTURE

Jack Chu, No. 1-67, Wen Long Ts'un, Ming Hsiung Hsiang, Chiayi Hsien, Taiwan

Filed May 16, 1989, Ser. No. 352,449
Int. Cl.[5] B60B *33/04*
U.S. Cl. 16—19 4 Claims



1. An improved adjustable wheel structure adapted for use in

a trailing vehicle comprising: an outer tube having a number of facets disposed at the top end thereof with a hand operated shaft being horizontally guided through the faceted portion, and a first bevel gear means being mounted to the shaft and located within said outer tube;

an inner tube disposed within said outer tube and having a closed top end which is provided with a hole so that a screw rod can be located therethrough; on the top portion of said inner tube being provided with a peripheral recess which defines an inward protrusion in said inner tube, thereby a supporting board having a central hole disposed thereon can be supported in place so as to form a chamber near the top portion of said inner tube;

a slidable nut member housed in said chamber at the top portion of said inner tube, having an oval-shaped through hole with said screw rod going therethrough; the surface of said oval-shaped hole being half threaded and half smoothed; a vertical hole being disposed on an upper wall of said nut member, in communication with a horizontal burrow horizontally disposed on a side wall of said nut member;

an adjusting bolt member having a peripheral groove disposed at the front end thereof being led through holes on the outer tube and inner tube and into said horizontal burrow with a pin element located in said vertical hole and engaged with said peripheral groove so as to operatively join said nut member and bolt member together;

the top end of said screw rod being provided with a second bevel gear engaged with said first bevel gear mounted on said shaft;

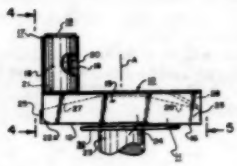
the hole on said outer tube, through which said adjusting bolt member is guided, being large enough to permit the bolt member to move upward or downward in adjustment along with the nut member in said inner tube; whereby the actuation of said adjusting bolt member can move said nut member inward or outward so as to keep the half threaded inner surface of said nut member engaged with or disengaged from said screw rod where the other half smoothed inner surface is in contact with said screw rod allowing the wheel structure to be adjusted in slow or fast manner.

4,918,784

T-HANDLE TURNER

Richard J. Cude, 102 S. 300 East, Copperton, Utah 84005, and Joseph N. King, 2189 W. 12974 South, Riverton, Utah 84065

Filed May 26, 1989, Ser. No. 357,097
Int. Cl.[5] A47B *95/02*
U.S. Cl. 16—114 R 3 Claims



1. A T-handle turner device including, in combination, a hollow elongate body, designed for releasably receiving a crossbar of an external T-handle the cross bar being provided with a shaft, said body having a partially open underside and also a central transverse axis of rotation; a rotatable handle pivotally mounted to said body opposite said underside and spaced from said axis; and spring means secured to said body proximate said underside for releasably receiving and constraining said shaft of said external T-handle, whereby to position the same in central alignment with said axis of rotation.

4,918,785

MECHANICAL KNOT FOR ROPES

Ralphael F. Spinner, deceased, late of R.R. 3, Hillsboro, Ill. 62049, and Clement F. Marley, R.R. 2, Box 165, Nokomis, Ill. 62075

Continuation-in-part of Ser. No. 113,468, Oct. 27, 1987, Pat. No. 4,872,240. This application Mar. 10, 1989, Ser. No. 321,579
Int. Cl.[5] B65H *69/04*; D03J *3/00*
U.S. Cl. 16—114 B 4 Claims

1. In combination, a cable or rope and a device for tying a knot in the cable or rope to form a first loop for connection to a load, the device comprising:

a hollow metal or plastic cylinder of uniform diameter along its entire length and having at least one longitudinal opening equal in length to from about two to four diameters of the cable or rope or cylinder;

wherein an end of the cable or rope is threaded through the device and a portion is pushed out of the device through the longitudinal opening to form a second loop, the end of the cable or rope is wound at least once about the device and is threaded with each winding through the second loop forming the knot.

4,918,786

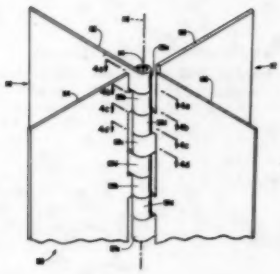
HINGE WITH LEAVES WHICH REINFORCE ONE ANOTHER AGAINST BENDING DEFLECTOR

John C. Perry, 3170 Falcon Dr., Carlsbad, Calif. 92008

Continuation of Ser. No. 35,746, Apr. 8, 1987, abandoned. This application Nov. 8, 1988, Ser. No. 270,442

Int. Cl.[5] E05D *5/06, 7/00*

U.S. Cl. 16—365 **4 Claims**



1. A hinge for pivotally joining two members comprising:

separate hinge leaves including at least one pair of separate hinge leaves to be secured to one member and at least one additional leaf to be secured to the other member, and each hinge leaf comprising an elongate strip having longitudinal edges,

rotary bearing means pivotally joining said hinge leaves along longitudinal edges thereof for independent rotation of each leaf relative to each remaining leaf about a pivot axis extending lengthwise of the leaves and comprising bearing sleeves on the hinge leaves along longitudinal edges of the leaves disposed in close end to end coaxial relation, and a hinge pin extending through the bearing sleeves, and wherein

(a) all of said bearing sleeves have approximately the same length and spacing along said axis, (b) each hinge leaf comprises at least one pair of coaxial bearing sleeves, (c) each pair of adjacent bearing sleeves on each hinge leaf straddle bearing sleeves on all of the other leaves but only a single bearing sleeve on each of the other hinge leaves, (d) the two hinge leaves of each leaf pair define therebetween an included angle and are relatively rotatable on said axis to vary said included angle, and (e) the two hinge leaves of each leaf pair are adapted to straddle their respective one of the members joined by the hinge, whereby each leaf of each leaf pair resists bending of the other leaf of the respective leaf pair.

4,918,787

POULTRY LUNG EXTRACTOR AND NECK BREAKER

Jacobus E. Hazenbroek, Burg. de Zeeuwstraat 52, Numansdorp, Netherlands

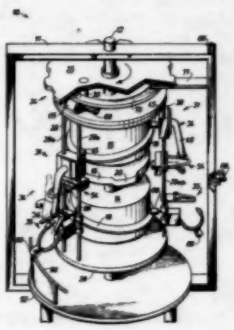
Filed Jan. 23, 1989, Ser. No. 299,406

Int. Cl.[5] A22C *21/00*

U.S. Cl. 17—11 **18 Claims**

1. A method of processing partially eviscerated poultry in which the birds are moved in series suspended invertedly by their legs from a conveyor through a series of processing stations, said method comprising the steps of:

moving the birds in sequence adjacent a lung extraction station having a lung extractor tube movably mounted for insertion downwardly into the visceral cavity of the bird and applying a suction to the extractor tube only when a bird is adjacent the lung extraction station, wherein in the



absence of a bird adjacent the lung extraction station no suction is applied.

4,918,788

PROCESS AND APPARATUS FOR RECOVERING MEAT FROM CARCASE SECTIONS IN PARTICULAR SEVERED ANIMAL HEADS

Bob Passchier, Earlspark, Loughrea, County Galway, Ireland

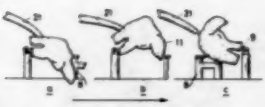
PCT No. PCT/NL88/00011, § 371 Date Nov. 23, 1988, § 102(e) Date Nov. 23, 1988, PCT Pub. No. WO88/07329, PCT Pub. Date Oct. 6, 1988

PCT Filed Mar. 22, 1988, Ser. No. 297,260

Claims priority, application Ireland, Mar. 24, 1987, 756/87

Int. Cl.[5] A22C *25/16*

U.S. Cl. 17—46 **25 Claims**



1. A continuous process for recovering meat from a plurality of animal carcass sections of the same type and approximately the same size in particular severed animal heads, which process comprises

(a) mounting the carcass parts in sequence on a continuously moving powered conveyor, by securing each part at one of its sides to one of a plurality of pivotally mounted locating members, the part resting at its other side on one of a plurality of supporting members so that by pivoting the part secured to said locating member said part can be turned upside down in which position it rests at its other end on a trailing or leading supporting member;

(b) advancing each mounted carcass section past a plurality of work stations, wherein a given work station may be attended by a manual operator or an automatic tool or a combination of both;

(c) dissecting each moving carcass part in a succession of steps, one at each work station, to obtain progressive separation of the meat from the bones; and,

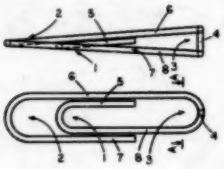
(d) recovering the separated meat.

4,918,789

TRIPOD CLIP

Haw-Renn Chen, and Feichu H. Chen, both of 4057 Little Hollow Pl., Moorpark, Calif. 93021

Filed Aug. 29, 1988, Ser. No. 237,947
Int. Cl.[5] B42F *1/02*
U.S. Cl. 24—67.9 **1 Claim**



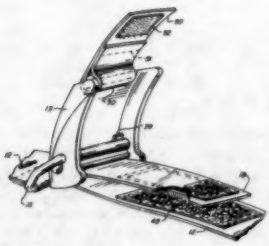
1. A clip with triangular cross section comprising three U-shapes with the smallest U-shape sitting inside the largest U-shape and the medium-size U-shape with two legs connected to one leg of each of said largest and smallest U-shapes sitting at the open end of said smallest and largest U-shapes contains one or more vertically-formed curvatures in the manner that said two legs of said medium-size U-shape lie on two planes with different orientation such that said smallest U-shape and said largest U-shape lie on said two planes while the leg with free end of said smallest U-shape is bent to be somewhat in parallel to said largest U-shape plane and the leg with free end of said largest U-shape is bent to be somewhat in parallel to said smallest U-shape plane whereby the capability of clipping a thick stack of paper or the like for said clip with triangular cross section is better than a clip without said vertically-formed curvatures.

4,918,790

CAM BUCKLE

Morgan T. Cirket, San Diego, and Michael J. Duly, Chula Vista, both of Calif., assignors to Soniform, Inc., El Cajon, Calif.

Filed May 12, 1989, Ser. No. 351,862
Int. Cl.[5] A44B *21/00*
U.S. Cl. 24—71 R **8 Claims**



1. A cam buckle for tightening a strip of web-like material about an article to be secured comprising:

a frame having a pair of side walls with front and rear ends,

a loop pivotally attached to said side walls, the loop being adapted for holding one end of said strip of web-like material,

a first bar extending between said side walls and attached thereto at a position forwardly of the pivotable attachment of the loop,

a second bar mounted on the side walls and extending generally parallel to the first bar, the second bar being adapted for holding the other end of said strip of web-like material,

the buckle being movable between an unlocked position in which the front ends engage the article to be secured and the pivotable attachment of the loop is above the second bar and a locked position in which the pivotable attachment of the loop moves rearwardly of the second bar and passes over center relative to the second bar, and

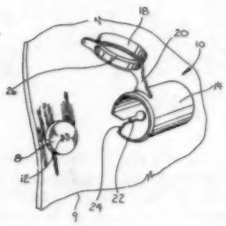
said second bar being slidably mounted on said side walls and being slidable toward said first bar when tension is exerted on the strip of web-like material whereby the strip is clamped between the first and second bars.

4,918,791

CLOTHING BUTTON GUARD

James A. Hardin, 317 Broadway, South Haven, Mich. 49090

Filed Mar. 6, 1989, Ser. No. 318,837
Int. Cl.[5] A44B *1/16*
U.S. Cl. 24—90.5 **4 Claims**



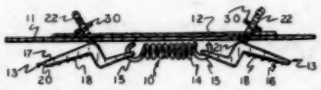
1. A guard for protecting a clothing button, said guard comprising a container having a side wall and an end wall to define an enclosure means for surrounding a clothing button, said side wall having an elongated longitudinal slot formed therein to allow said clothing button to be slid completely into said enclosure means, and a cap releasably secured to said guard side wall at a top edge thereof wherein said clothing button is virtually surrounded by said guard.

4,918,792

DEVICE FOR ATTACHING A LICENSE PLATE TO AN AUTOMOBILE

Edward E. Engels, 50 Chapin Greene Dr., Ludlow, Mass. 01056

Continuation-in-part of Ser. No. 105,865, Oct. 8, 1987, abandoned. This application Oct. 7, 1988, Ser. No. 254,614
Int. Cl.[5] A44B *15/00*
U.S. Cl. 24—300 **6 Claims**



1. A fastening device intended to engage holes of a conventional license plate comprised of paired identical anchoring means interconnected by a coil spring, said anchoring means being comprised of:

(a) an abutment base having a flat first surface and an opposite second surface, first and second extremities, and a fulcrum shoulder disposed upon said first surface at said first extremity,

(b) a straight penetrating post perpendicularly emergent from said first surface adjacent said first extremity, said post having a series of conical serrations, each serration having a top extremity, and a bottom extremity of larger diameter than said top extremity, said bottom extremities being directed toward said first surface,

(c) an offset leg emergent from said second surface at a site opposite said post, and

(d) a connecting arm emergent from said offset leg in a direction away from said abutment base and centered upon a plane substantially parallel to said abutment base, said connecting arm terminating in a distal extremity having an aperture,

said anchoring means being interconnected by way of said apertures to the extremities of said coil spring whose length is such that the spring is under tension when the penetrating posts are inserted into the holes of the license plate.

4,918,793

ZIP FASTENER AND A PROCESS FOR ITS MANUFACTURE

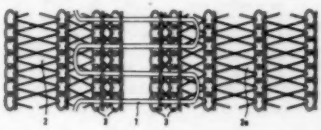
Siegfried W. Spindler, Schondorf, Fed. Rep. of Germany, assignor to Ries GmbH Bekleidungsverschlussfabrik, Fed. Rep. of Germany

Filed Oct. 6, 1987, Ser. No. 104,906

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1986, 3634162

Int. Cl.[5] A44B *19/10, 19/56*

U.S. Cl. 24—392 **8 Claims**



1. A zip fastener comprising:

coupling member rows each comprised of a continuous monofilament connected to a carrying tape, said carrying tape being comprised of two strips of knitted textile fabric each having the loops of at least two wales adjacent one margin disposed in closely spaced relation to each other and the loops of the remaining wales being substantially spaced from each other with transversely extending yarns interconnecting adjacent wales and

said continuous monofilament having an S-shaped configuration folded back upon itself along a centes longitudinal axis to define two plies with the monofilament of each ply being knitted only into said closely spaced loops adjacent said one margin of each strip respectively with said one margins of said strips being disposed in superimposed alignment with each other adjacent said longitudinal axis.

5. Process for the manufacture of a zip fastener comprising coupling member rows each comprised of a continuous monofilament connected to a carrying tape comprising:

knitting two strips of textile fabric each having the loops of at least two wales adjacent one margin disposed in closely spaced apart relation to each other and the loops of the remaining wales being substantially spaced from each other with transversely extending yarns interconnecting adjacent wales, inserting a continuous S-shaped monofilament into only said loops of said at least two wales during knitting with said one margins of said strips being disposed adjacent each other and folding said S-shaped monofilament back upon itself along a central longitudinal axis extending between said strips.

4,918,794

PULL FOR SLIDE FASTENER SLIDERS

Billy R. Harvey, and David W. Rohrer, both of Jackson, Wyo., assignors to Life-Link International, Inc., Jackson, Wyo.

Filed Oct. 13, 1987, Ser. No. 107,095

Int. Cl.[5] A44B *19/26*

U.S. Cl. 24—429 **7 Claims**

1. In a slide fastener comprising a slider and a pull tab connected to said slider having an opening therein, the improvement comprising a flexible elastic pull member attachment attached to said pull tab, said member having a length at least twice that of its width and an upper and lower portion thereof,

the upper portion of said member defining a slot of a size sufficient to accept the lower portion of said member, said member comprising an elastomeric foam with a fabric backing on at least one side thereof.

4,918,795

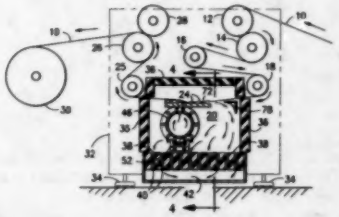
METHOD TO SOFTEN FABRIC BY AIR IMPINGEMENT

Louis Dischler, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Continuation of Ser. No. 243,201, Sep. 8, 1988, abandoned, which is a continuation of Ser. No. 171,261, Mar. 21, 1988, abandoned, which is a division of Ser. No. 74,568, Jul. 17, 1987, Pat. No. 4,837,902. This application Aug. 10, 1989, Ser. No. 391,690

Int. Cl.[5] D06C *19/00*

U.S. Cl. 26—1 **2 Claims**



1. The method of treating a web of fabric comprising the steps of: supplying a web of fabric at low tension, taking up the web of fabric supplied and breaking up the fiber-to-fiber bonds in the web of fabric between the supply and take-up thereof by projecting a plurality of low pressure, high velocity streams of gaseous fluid against only one side of the web of fabric in a direction opposite and substantially tangential to the path of travel of the web of fabric causing vibrations in the web of fabric to create saw-tooth waves therein having small bending radii which travel down the fabric to increase the drape and flexibility thereof.

4,918,796

TENSIONING MACHINE

Harry Gresens, Benningen, Fed. Rep. of Germany, assignor to Bruckner Trockentechnik GmbH & Co. KG, Leonburg, Fed. Rep. of Germany

Filed Apr. 22, 1985, Ser. No. 725,903

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1984, 3423905; Aug. 31, 1984, 3432177

Int. Cl.[5] B65H *23/028;* **D06C** *3/04*

U.S. Cl. 26—94 **14 Claims**

1. In a tensioning machine for the treatment of a length of textile fabric, said machine including:

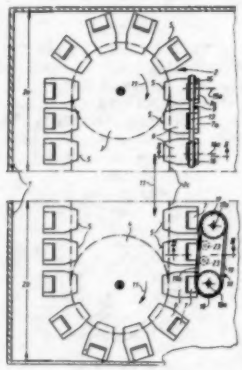
(a) an endless conveyor strand movable continuously along

a horizontal fabric conveying path from a fabric inlet end to a fabric outlet end, and return, and

(b) a plurality of spaced apart grippers carried by said conveyor strand, each of said grippers having a support table for supporting one edge of said fabric and a two-arm flap rockable about a horizontal axis between said arms and above said table between a closed position in which a first arm of said flap on one side of said axis and at a level between said axis and said table is enabled to clamp said fabric against said table and an open position in which said first arm of said flap is disabled from clamping said fabric against said table, each of said flaps having its second arm on the opposite side of said axis,

the improvement comprising:

(c) flap closing means at the inlet end of said path engageable with the second arm of each of said flaps for rocking each of said flaps to its closed position as it arrives at said inlet end,



(d) continuously movable flap opening means at the outlet end of said path for rocking each of said flaps to its open position as it arrives at said outlet end;

(e) releasable latch means for releasably maintaining said flap in its open position during the return of said strand from the outlet end to the inlet end;

(f) means mounting said flap opening means alongside said conveyor strand in the path of movement of each of said flaps and at such level as to engage said first arm of each of said flaps between said axis and said table with sufficient force to rock each such flap from its closed position to its open position and to effect latching engagement of said flap with said latch means; and

(g) means for continuously driving said flap opening means in the direction of movement of said conveying path and at substantially the same speed as said conveyor strand.

4,918,797

METAL ROOF PANEL SEAMER APPARATUS

Neil A. Watkins, Rte. 5, Box 9; Peter M. Rook, Rte. 5, Box 69, both of Starkville, Miss. 39759, and George Woodruff, Rte. 6, Box 248, Corinth, Miss. 38834

Filed Feb. 17, 1989, Ser. No. 312,733

Int. Cl.[5] B21D *37/00*

U.S. Cl. 29—243.5 **9 Claims**

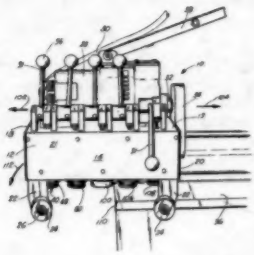
1. A self-propelled, bi-directional apparatus for forming a standing seam joining metal roof panels, of the type having side portions that terminate upwardly with a preformed partially closed interlocking portion to be substantially parallel with the plane of the panel, the apparatus comprising:

(a) a support frame;

(b) a first plurality of drive rollers, positioned along the frame for contacting an end portion of a panel;

(c) a second plurality of seam forming rollers, positioned along each side of the drive rollers, and moveable a sufficient distance from the corresponding drive roller to straddle the unformed seam between the drive roller and the seam roller;

(d) means for camming each seam roller independently of



the other seam rollers to a second position to engage into the seam between the first pair of seam and drive rollers;

(e) means for camming each subsequent seam roller against its corresponding drive roller to form the seam from its first unseamed configuration to its formed configuration; and

(f) a third plurality of rollers for allowing the machine to move in the opposite direction when the third plurality of rollers are engaged against the seam.

4,918,798

RIVET REMOVAL TOOL

Charles R. Reed, P.O. Box 4316, Elkhart, Ind. 46514

Filed May 23, 1988, Ser. No. 197,528

Int. Cl.[5] B23P *11/00*

U.S. Cl. 29—243.54 **18 Claims**

1. A tool for removing fasteners from a workpiece, said tool comprising an elongate generally tubular housing, a longitudinal bore having a continuous inner surface defined through said housing, said housing including a lower positioning part, and an upper support part slidably connected to said lower positioning part, means to movably connect said upper support part and said lower positioning part while maintaining said continuous inner surface, a shaft located in said housing bore and supported by said housing upper part, said shaft slidable within said bore relative to said housing lower part and con-

tacting said bore inner surface along the entire length of said bore inner surface to support the shaft, and means for sliding said housing upper part and shaft between a first position wherein a terminal end of said shaft is spaced from a workpiece and a fastener to be removed, and a second position wherein said housing upper part and shaft are urged toward said workpiece with said shaft forcibly contacting said fastener to remove the fastener from the workpiece, shoulder means at an upper end of the bore inner surface, said shaft abutting said shoulder means inner surface at both said first and second positions of the housing to provide constant longitudinal support for the entire length of the shaft whereby the housing supports the entire shaft against vibrational forces transmitted from the lower end of the shaft.

4,918,799

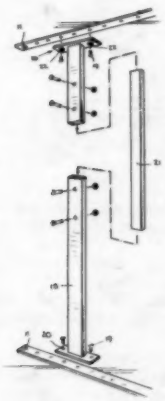
METHOD AND APPARATUS FOR FORMING STRINGERS FOR FREE-STANDING CIRCULAR STAIRCASES

Louis Benedetti, 10 Continental Ave., Forest Hills, N.Y. 11375

Filed Apr. 10, 1989, Ser. No. 335,992

Int. Cl.[5] B23Q *3/00*; B27H *1/00*

U.S. Cl. 29—467 **8 Claims**



1. A method of forming stringers for a curved staircase, said method comprising the steps of:

connecting beams between corresponding points on first and second patterns so that said beams are substantially perpendicular to said patterns, said patterns having a plurality of radial lines of said points indicated thereon;

attaching portions of a stringer to respective beams, at a height that increases from beam to beam for each consecutive beam; and

removing the stringer from said beams when the form of the stringer is set.

4,918,800

CONTINUOUS METHOD FOR MAKING DECORATIVE SHEET MATERIALS

Gerald G. Reafler, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 3, 1989, Ser. No. 332,191

Int. Cl.[5] B21B *1/24*

U.S. Cl. 29—527.2 **5 Claims**

1. A continuous method for making a protective and decorative sheet material which comprises:

(A) forming a highly reflective, specular, continuous metal layer on a continuously moving web of a stretchable, thermoformable, polymeric carrier film; and

(B) cracking the metal layer biaxially at a temperature below the glass transition temperature of the carrier film by continuously bending and drawing the web around a first cracking member having a linear cracking edge to create a first series of substantially linear and parallel microscopic cracks in the metal layer, continuously bending and drawing the web around a second cracking member having a linear cracking edge which is non-parallel to the first cracking member edge to create a second series of substantially linear and parallel microscopic cracks in the metal layer, said first series of cracks being non-parallel to the second series, and thereby forming in the metal layer a substantially regular, microscopic parallelogram crack pattern, the so cracked metal layer

(a) having a 20-degree gloss of at least 100; and

(b) being capable, when the sheet material is stretched above the glass transition temperature of the carrier film, of exhibiting a brushed metal appearance having a 20-degree gloss of less than 100.

4,918,801

INSULATION SYSTEM METHOD FOR MULTITURN COILS OF HIGH VOLTAGE ELECTRICAL ROTATING MACHINES

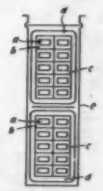
Kurt K. Schwarz, and Thomas D. Smith, both of Norwich, England, assignors to Laurence, Scott & Electromotors Ltd., Norwich, United Kingdom

Filed Jun. 3, 1988, Ser. No. 201,788

Claims priority, application United Kingdom, Jun. 4, 1987, 8713087

Int. Cl.[5] H02K *15/06*

U.S. Cl. 29—596 **9 Claims**

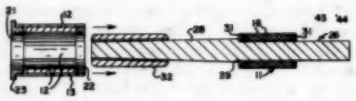


1. A method of insulating sultiturn high voltage stator windings of electrical rotating machines, comprising the steps of applying interturn insulation in the form of glass-backed mica paper pre-treated with resin taken to a B-stage cure, at least to straight, slot engaging parts of the windings prior to mounting thereof on the stator, mechanically consolidating and thermally curing said interturn insulation, applying main insulation to said slot-engaging parts, said parts having consolidated and cured interturn insulation, and end parts of the windings in the form of glass backed mica paper pre-treated with resin without a curing agent, mounting said slot engaging parts of the windings on the stator, connecting end parts of the windings to said slot engaging parts thereof so as to electrically complete said windings and impregnating the electrically completed windings on the stator with a resin compound by a vacuum and pressure process followed by a thermal cure.

4,918,802
METHOD AND APPARATUS FOR MAKING PERMANENT MAGNET ROTORS

Edward J. Schaefer, Bluffton, Ind., assignor to Franklin Electric Co., Inc., Bluffton, Ind.

Filed Feb. 6, 1989, Ser. No. 306,687
Int. Cl.[5] H02K 15/02
U.S. Cl. 29—598 18 Claims



1. A method of manufacturing a rotor, comprising the steps of:

(a) positioning a plurality of permanent magnet segments at angularly spaced locations within the interior or a thin-walled metal cylinder, the interior surfaces of said segments forming an interior opening;

(b) moving an expanding means into said interior opening formed by said segments;

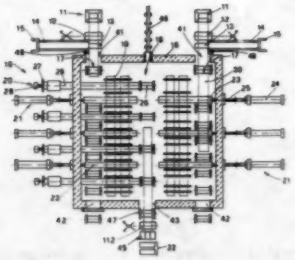
(c) moving said expanding means to displace said segments outwardly against said cylinder and elastically stretch said cylinder; and

(d) replacing said expanding means with support means for holding said segments in said outwardly displaced positions.

4,918,803
PLANT FOR ROLLING LONG PRODUCTS FROM BILLETS AND BLOOMS COMING FROM A PLURALITY OF CONTINUOUS CASTING LINES

Bruno DiGiusto, Udine, Italy, assignor to Danieli & C. Officine Meccaniche SpA, Buttrio, Italy

Filed Jul. 18, 1988, Ser. No. 220,684
Claims priority, application Italy, Aug. 5, 1987, 83428 A/87
Int. Cl.[5] B21B 1/26, 1/46, 13/22; B22D 11/12
U.S. Cl. 29—33 C 12 Claims

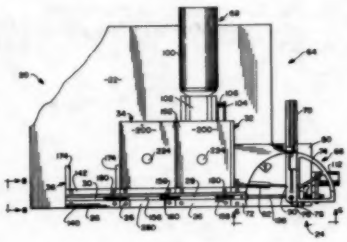


1. A plant for rolling long products from billets and blooms coming from at least two continuous casting lines, each said at least two continuous casting lines including a shears, said plant comprising a temperature-equalizing furnace disposed downstream of the shears and comprising an inlet in the temperature-equalizing furnace downstream of each said at least two continuous casting lines, an intake roller conveyor downstream of each said inlet, fixed supports defining a zone of equalization of the temperature of the billets and blooms, a discharge rollery conveyor disposed in an intermediate position in said temperature-equalizing furnace between said intake roller conveyors, said discharge roller conveyor including discharge rollers supported by a roller support device, said roller support device including means for transversely and vertically displacing said discharge rollers, internal traversing means for transferring the billets and blooms from said intake roller conveyors to said fixed supports and for moving the billets and blooms on said fixed supports to said discharge rollers of said discharge roller conveyor, and an outlet in the temperature-equalizing furnace downstream of said discharge roller conveyor.

4,918,804
MODULAR APPLICATION TOOLING FOR ELECTRICAL CONNECTORS

Eric P. Bleuel, Woodridge; Peter Ingwersen, Gilberts; Leonard J. Lickus, Plainfield; Thomas P. Pellegrino, Lisle; Hasmukh Shah, Wheaton, and Robert A. Suthard, Woodridge, all of Ill., assignors to Molex Incorporated

Filed Mar. 6, 1989, Ser. No. 320,021
Int. Cl.[5] H01R 43/00
U.S. Cl. 29—33 M 19 Claims



1. Modular application tooling for electrical connectors each having a housing and electrical terminals, said tooling comprising:

a base unit including a connector feed drive system and a work station drive system;

at least one modular feed track unit including a track segment defining a feed track extending along a feed path in a feed direction;

said base unit including a connector delivery unit for delivering electrical connectors to said feed track;

at least one modular pusher unit including a body portion movable in said feed direction and including a pawl member supported by said body portion and receivable into said feed path for advancing electrical connectors along said feed path;

said connector feed drive system including means for selectively moving said pusher unit in said feed direction; and

at least one modular work station including a tooling component movable relative to said feed path;

said work station unit including a drive takeoff system connected between said work station drive system comprising a continuously operated work station drive motor and said tooling component for selectively operating said tooling component.

4,918,805
WELDING METHOD FOR CYLINDER HEAD REPAIR

Kenneth J. Liszka, Downers Grove; Daniel J. Dobruse, Oak Park, both of Ill.; Steve E. Potopa, Phillips, Wis.; Charles E. Gammill, Greenville, and Jerry D. Gammill, Leland, both of Miss., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 22, 1988, Ser. No. 288,521
Int. Cl.[5] B23P 15/00
U.S. Cl. 29—888.06 5 Claims

1. A method for repair and rebuilding of pot-type cast iron cylinder heads for diesel engines, said method including the steps of:

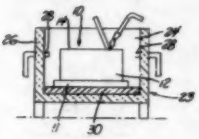
determining the locations of any cracks and rejecting any heads unsuitable for repair;

placing each non-rejected head in an individual insulated oven having an insulated lid;

preheating the head in the oven to a suitable temperature for welding;

if required, building up the entire fireface with weld metal applied by gas welding;

gas welding any cracks in the head while maintaining the preheat temperature and protecting the valve seats and injector well from contact with molton weld metal; and



after welding, encapsulating the head in the oven with the lid in place and allowing to cool;

wherein the improvements comprise;

establishing said suitable preheating temperature at a minimum of about 1800 degrees F. and attaining said suitable temperature over a time period of at least 40 minutes;

performing welding of the fireface and other repair areas with cast welding rod equivalent to AWS RC1-A specification; and

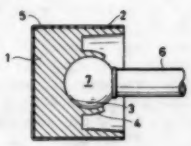
continuing the encapsulated oven cooling step for a time sufficient to remove residual stresses.

4,918,806

METHOD FOR MANUFACTURING A PISTON

Ryuji Watanabe, Oizumi; Motohiko Kosano, Isezaki, and Hirokazu Kawakami, Ota, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Feb. 14, 1989, Ser. No. 310,790
Claims priority, application Japan, Feb. 18, 1988, 63-35674
Int. Cl.[5] B23P *15/10*
U.S. Cl. 148—16.5 **9 Claims**



1. A method of manufacturing a piston comprising the steps of:

forming a generally cylindrical metal piston with a main body having an outer first diameter and with a skirt wall extending from the main piston body with the skirt wall outer diameter tapering inwardly towards its free end to have a diameter less than said first diameter, and

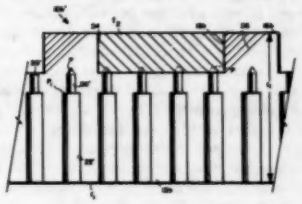
heat treating the piston to cause the skirt wall to expand outwardly to assume substantially said first diameter.

4,918,807

SCREEN AND METHOD OF MANUFACTURE

Frey A. Frejborg, Glens Falls, N.Y., assignor to A. Ahlstrom Corporation, Karhula, Finland

Filed Oct. 19, 1988, Ser. No. 259,816
Int. Cl.[5] B23P *15/16*
U.S. Cl. 29—163.8 **16 Claims**



1. A method of manufacturing a metal screen generally flat plate having first and second opposite faces, comprising the steps of:

(a) drilling first holes having a first diameter through said first face and into the body of the metal screen plate a predetermined distance to terminate within the plate body at a position P short of said second face;

(b) drilling second holes of a second diameter, larger than the first diameter, through said first face, generally concentric with said first holes; and

(c) machining the second face to remove metal material along the majority of the surface thereof to a depth to expose the position P so that the first holes extend entirely through the plate body, and leave the plurality of parallel, substantially continuous ridges in said second face spaced one from the other defining slots therealong after machining is completed.

9. A method of manufacturing a metal screen generally flat plate having first and second opposite faces, comprising the steps of:

(a) forming first openings through said first face and into the body of the screen plate a predetermined distance to terminate within the plate body short of said second face;

(b) forming second openings through the first face larger than the first openings, and generally concentric therewith; and

(c) removing material from said second face in longitudinally extending generally parallel rows thereof along the majority of the surface thereof to a depth at least equal to the depth of the plate less said predetermined distance to form a plurality of grooves in said second face so that the openings extend entirely through the plate body and open into said grooves, but leave a plurality of continuous ridges in said second face spaced one from the other on opposite sides of said grooves after material removal is completed.

4,918,808

DEVICE FOR REMOTELY LINING A STEAM GENERATOR TUBE OF A PRESSURIZED WATER NUCLEAR REACTOR

Jean P. Cartry, and Bruno Fraissenet, both of Lyons, France, assignors to Framatome, Courbevoie, France

Division of Ser. No. 44,254, Apr. 30, 1987, Pat. No. 4,793,044.
This application Nov. 22, 1988, Ser. No. 274,893
Claims priority, application France, Apr. 30, 1986, 86 06342
Int. Cl.[5] B23P *15/26*
U.S. Cl. 29—727 **8 Claims**

1. Device for remotely lining a steam generator tube of a pressurized water nuclear reactor, the tube (8) having two ends crimped into a tube plate (2) having a thickness, brelow said tube plate said steam generator forming a water box (3) accessi-

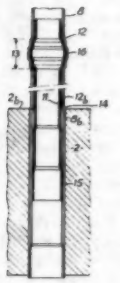
ble from outside through a manhold (9), by insertion of a liner (12) into said tube (8) through one of its ends, diametral expansion of said liner (12) in at least two expansion regions situated in the vicinity of its ends, one of said regions being within the thickness of said tube plate (2) and the other beyond said tube plate (2), and crimping by roller-expanding of said liner (12) in each of said regions, said device comprising

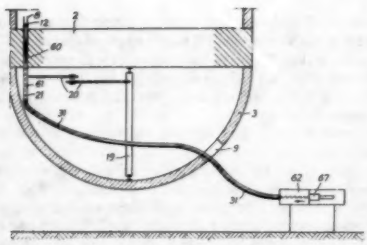
(a) a manipulating means (19) equipped with an arm (20) whose end is vertically alignable with any one of the tubes (8) of said steam generator, under said tube plate (2);

(b) a tubular guiding member (21) attached to the end of said arm (20) in a direction at right-angles to said tube plate (2);

(c) a flexible tube (31) attached at one of its ends to said tubular guiding member (21) passing through said manhole and having its other end outside said water box;

(d) a loading and manipulating assembly (22, 23, 24) adapted to be connected to an end of the flexible tube (31) which is external to said water box for introducing and moving a liner (12), inside said flexible tube (31);





(e) a hydraulic expander (34) which is placed inside said liner (12) and attached, in order to be moved, to the end of a flexible tubular member (30) which is connected to means for supplying a pressurized hydraulic fluid to said expander (34); and

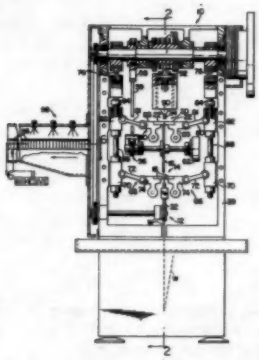
(f) a manipulating and roller-expanding assembly (60, 61, 62) comprising a roller-expanding appliance (60), a tubular flexible member (61) and a manipulating device (62), said roller-expanding appliance being connected to an end of said flexible tubular member, and said manipulating device being arranged outside said water box and associated to said flexible member so that said flexible member (61) and said roller-expanding appliance (60) can move in said flexible tubing (31), said roller-expanding appliance (60) being further connected to driving means (67, 74, 75) by flexible member (76) passing through said flexible tubular member (61).

4,918,809

NAIL MAKING MACHINE

Wilhelm A. Steinhilber, 124 White Birch Dr., Guilford, Conn. 06437

Filed Dec. 18, 1987, Ser. No. 134,944
Int. Cl.[5] B21G 3/20
U.S. Cl. 29—792 29 Claims



1. A nail making machine comprising a first workstation, wire feeding means for delivering an axially elongated wire having a free end to said first workstation, wire pointing and cutting means at said first workstation for forming a pointed nail blank from the wire and severing the pointed nail blank from the wire, a second workstation having a second station axis, nail blank conveying means for moving a nail blank from said first workstation to said second workstation and supporting the nail blank at said second workstation with a free end portion of the nail blank in a head forming position wherein the axis of the nail blank is coaxially aligned with said second station axis, heading means for delivering a head forming blow to the free end portion of a pointed nail blank supported in said forming position at said second workstation and including a ram supported for movement toward and into head forming engagement with the free end portion of a nail blank supported in said forming position and away from said second workstation, and gripping means for applying holding force to a pointed nail blank such as aforesaid to hold the nail blank in said forming position and increasing the holding force applied to the nail blank in response to movement of the ram into head forming engagement with the free end and including a pair of holding jaws disposed at laterally opposite sides of said second station axis, means for supporting said jaws for pivotal movement in opposite directions about laterally spaced apart pivot axes located at opposite sides of said second station axis and along a line normal to said second station axis and spaced from said jaws in a direction away from said ram along said second station axis, and means for pivoting said supporting means between a closed position wherein said jaws engage and hold a pointed nail blank such as aforesaid in said forming position and an open position wherein said jaws are out of holding engagement with a pointed nail blank.

4,918,810

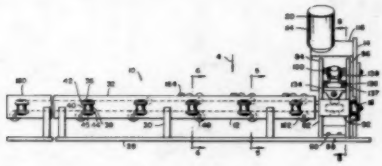
STRUCTURE FOR SECURING COMPOSITE MEMBERS TOGETHER

Richard N. Anderson, 9885 Melba La., Whitesville, Ky. 42378

Filed Oct. 3, 1980, Ser. No. 193,816
Int. Cl.[5] B23P 19/00
U.S. Cl. 29—798 22 Claims

1. Structure for securing an elongated wood member having longitudinally extending spaced apart recesses in one side thereof to an elongated metal member having at least one

substantially flat side with transversely spaced apart longitudinally extending flanges extending outwardly therefrom to form a generally U-shaped configuration with the flat side comprising means for guiding the wood member together with the metal member in movement toward means for deforming a portion of one of the flanges of the metal member into the wood member with the flanges of the metal member extending within the recesses in the wood member in an exact finished relation of the wood member with the metal member and deforming means positioned adjacent the wood member and



metal member and operably associated therewith with the flanges of the metal member extending within the recesses in the wood member in an exact finished relation of the wood member with the metal member for deforming the one flange of the metal member toward the other flange of the metal member into the wood member at the side of one of the recesses in the wood member which the one flange extends within which side is closest the other flange of the metal member to lock the wood and metal members together into a composite member as the wood and metal members are passed through the deforming means.

4,918,811

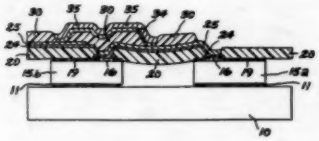
MULTICHIP INTEGRATED CIRCUIT PACKAGING METHOD

Charles W. Eichelberger, Schenectady, and Robert J. Wojnarowski, Ballston Lake, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 215,187, Jul. 5, 1988, abandoned, Division of Ser. No. 912,456, Sep. 26, 1986, Pat. No. 4,783,695. This application Aug. 8, 1989, Ser. No. 391,398

Int. Cl.[5] H05K *3/34*

U.S. Cl. 29—840 **5 Claims**



1. A method for packaging integrated circuit chips, said method comprising the steps of:

disposing a plurality of integrated chips on a substrate, said chips including interconnection pads;

applying a polymer film layer over said chips and said substrate so that said film bridges said chips in a manner to leave vacant space between said film and said substrate;

providing a plurality of via openings in said polymer film, said openings being disposed over at least some of said interconnecting pads; and

providing a pattern of electrical conductors on said film so said conductors extend between said via openings so as to electrically connect selected interconnection pads.

4,918,812

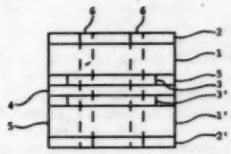
PROCESSING OF CORES FOR CIRCUIT BOARDS OR CARDS

Robert E. Ruane, Endicott, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1988, Ser. No. 213,944

Int. Cl.[5] H05K *3/10*

U.S. Cl. 29—846 **7 Claims**



1. A method for processing cores for circuit boards or cards which comprises:

(a) providing two coresx, each being a dielectric material having conductive planes on both major surfaces thereof;

(b) providing said two cores with internal conductive planes and external conductive planes wherein the internal conductive planes are smaller than the external conductive planes, but larger than the desired dimensions of the final core;

(c) temporarily fixing together said two cores by placing between the internal conductive planes an adhesive sheet of prepreg dielectric and subsequently sealing the peripheral face planes;

(d) simultaneously processing the two external conductive planes to thereby form signal patterns; and

(e) removing said seal from the peripheral face planes and separating the cores from each other, thereby simultaneously providing said two cores, each having one signal plane and one uncircuitized plane.

4,918,813

METHOD OF SHAPING PLUG RECEPTACLE

Akio Mori; Kazuhiro Watanabe, and Shoichi Mochizuki, all of Goenba, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Jul. 21, 1989, Ser. No. 382,949

Claims priority, application Japan, Aug. 23, 1988, 63-207396

Int. Cl.[5] H01R *43/16*

U.S. Cl. 29—874 **6 Claims**

1. A method of shaping a receptacle, comprising the steps of:

providing a connective plate (11) at one end of a strip-like conductor (1), the connective plate having a first portion (11*a*) disposed perpendicular to longitudinal edges (7) of said conductor and a second portion (11*b*) disposed parallel to the longitudinal edges;

providing a stamped blank (M) having a resilient contact plate (3) extending from said second portion of said connective plate, and finger-shaped projections (5, 5') extending respectively from opposite sides of said resilient contact plate through respective extensions (4);

bending said extensions in such a manner that flat surfaces of

said finger-shaped projections are disposed perpendicular to flat surfaces of said resilient contact plate;

subsequently bending said first portion of said connective plate in such a manner that the flat surfaces of said resilient contact plate are disposed perpendicular to flat surfaces of said strip-like conductor; and

subsequently further bending the first portion of said connective plate such that the flat surfaces of the finger-shaped projections are perpendicular to the flat surfaces of said strip-like conductor.

4,918,814

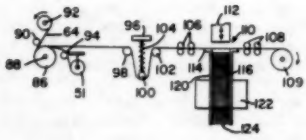
PROCESS OF MAKING A LAYERED ELASTOMERIC CONNECTOR

John P. Redmond, 5213 Deerfield Ave., Mechanicsburg, Pa. 17055; Ray N. Shaak, 1303 King St., Lebanon, Pa. 17042, and Albert Shirk, 139 N. Locust St., Palmyra, Pa. 17078

Division of Ser. No. 898,857, Aug. 20, 1986, abandoned, which is a continuation of Ser. No. 683,987, Dec. 20, 1984, abandoned. This application Jan. 22, 1988, Ser. No. 146,879

Int. Cl.[5] H01R *13/48*

U.S. Cl. 29—878 **12 Claims**



1. A method for producing a layered elastomeric connector for establishing electrical contact between at least two discrete electrically conductive surfaces, including the steps of:

a. selecting a plurality of electrically conductive fibrous mats and a plurality of sheets of a heat bondable electrically nonconductive elastomer of substantially equal size,

b. exposing the fibrous mats to a coupling agent to promote bonding prior to stacking and drying the mats prior to stacking,

c. alternately stacking the elastomer sheets and the fibrous mats to form an alternating stratified arrangement,

d. heating the stacked sheets and mats thereby bonding the fibrous mats and the elastomer into a unitary stratified structure.

4,918,815

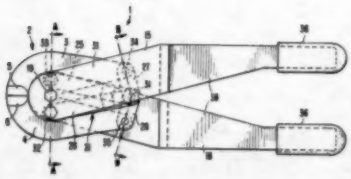
MULTI-LINK CUTTING TOOL

Karel B. F. Juros, 705 Hillwood Dr., Statesboro, Ga. 30458

Filed Jan. 9, 1989, Ser. No. 294,450

Int. Cl.[5] B26B *17/00, 17/02, 17/04*

U.S. Cl. 30—191 **13 Claims**



1. A multi-link cutting tool comprising: a concentric-cutter head; a first and second handle, each of which is held in position and pivots about the center of the concentric cutter head; and a connecting linkage between each handle and the concentric cutter head comprising: a first link connecting the first handle and a pivot pin; a second link connecting the second handle and the pivot pin; a third link connecting the pivot pin and a first jaw member of the concentric cutter head; and a fourth link connecting the pivot pin and a second jaw member of the concentric cutter head.

4,918,816

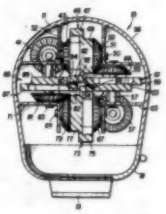
PENCIL SHARPENER

Anthony J. Alpha, P.O. Box 844, Amelia, La. 70340

Filed Mar. 28, 1989, Ser. No. 329,547

Int. Cl.[5] B21D *39/00*

U.S. Cl. 30—452 **10 Claims**



1. An improved pencil sharpener having a sharpener mechanism comprising:

(a) an actuator shaft bearingly supported by support structure;

(b) force transmission means associated with said shaft for transmitting rotations of said shaft;

(c) a first pair of opposed cutters drivingly connected with said shaft via said force transmission means;

(d) a second pair of opposed cutters drivingly connected with said shaft via said force transmission means;

(e) each said cutter having a cutting surface extending completely circumferentially thereabout; and

(f) said cutters comprising cutting means configured for sharpening a pencil of elongated cross-section.

4,918,817

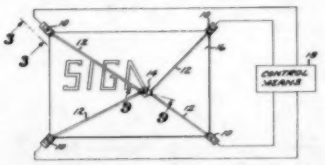
ARTICLE POSITIONING APPARATUS

Homer L. Eaton, 652 Neptune Ave., Leucadia, Calif. 92204

Continuation-in-part of Ser. No. 101,420, Sep. 28, 1987, abandoned. This application Jan. 5, 1989, Ser. No. 293,821

Int. Cl.[5] G01B *5/24*

U.S. Cl. 33—1 M **11 Claims**



1. In apparatus for positioning an article at particular X, Y plot coordinates of a work surface, one or more positioners coupled to the article and responsive to control means operative to generate control signals corresponding to the X, Y plot coordinates, each positioner comprising:

a work platform adapted to be fixed relative to the work surface;

a mounting body pivotally carried by the work platform for rotation in an arc about an axis perpendicular to the work surface;

tape drive means carried by the mounting body and having a drive shaft rotatable in response to control signals from the control means;

a tape spool rotatably carried by the mounting body;

an elongated tape wound upon the tape spool, coupled to the tape drive means, and connected at one end to the article, the tape having tape indicia at predetermined intervals along its length, and further having sufficient stiffness to resist bending under compressive loads applied by the tape drive means whereby operation of the tape drive means in one direction pulls upon the tape, and in the opposite direction pushes upon the tape, thereby to pull or push the article over the work surface; and

tape movement sensor means fixed relative to the tape and cooperative with the tape indicia as the tape indicia moves past the tape movement sensor means to provide feedback signals to the control means corresponding to longitudinal movement of the tape relative to the mounting body.

4,918,818

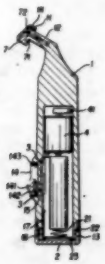
MULTI-PURPOSE MASSAGE SHAVER

Yin-Fei Hsieh, No. 10, Subiane 12, Lane 629, Neihu Road, Sec. 1, Taipei, Taiwan

Filed Sep. 22, 1988, Ser. No. 247,287

Int. Cl.[5] B26B *19/38*

U.S. Cl. 30—34.05 **4 Claims**



1. A multiple purpose masager and shaver device comprising:

an elongated housing having a generally cylindrical base and central portion and a generally conical upper portion, the base having an open lower end and said base and central portion being hollow;

end sealing means including a cap threadedly mounted on the open end of said base for releasably sealing said open end so that the hollow interior of said housing is waterproof when said cap is mounted on said base;

an electric motor mounted in the hollow central portion of said housing;

vibrator means including a block and an eccentric drive therefor coupled to said motor; battery means mounted in the hollow base of said housing; external switch means mounted on said housing and coupled between said battery means and said motor for selectively energizing said motor to drive said block in eccentric rotation to thereby cause said housing to vibrate;

mounting means including a laterally extending U-shaped track mounted on the upper end of said housing at substantially the apex of the conical end for receiving a shaver head or a massage head; and lock means carried by said track for releasably securing a head on said track.

4,918,819

ELECTRIC SHAVING APPARATUS

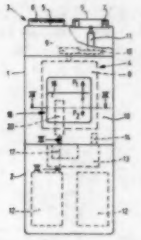
Hans Lahrijn, Drachten, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

Filed Sep. 26, 1988, Ser. No. 249,615

Claims priority, application Netherlands, Oct. 5, 1987, 8702363

Int. Cl.[5] B26B *19/38*

U.S. Cl. 30—43 **7 Claims**



1. An electric shaving apparatus comprising at least one drivable shaving member, a first housing section which accommodates the drive mechanism for the shaving member and a detachable second housing section which accommodates an electric power source; and a switching device which comprises an actuating member and a contact member, said switching device being arranged in an electric circuit which also includes the drive mechanism and the power source, wherein the actuating member is arranged on a wall of the first housing section and is detachably coupled to the contact member in the second housing section by mechanical means comprising a crank shaft having crank webs and a connecting rod, the crank shaft being rotatably supported in said wall of the first housing section, a crank web at the outer side being provided with a crank pin and the connecting rod being coupled to a crank web at the inner side of said wall.

4,918,820

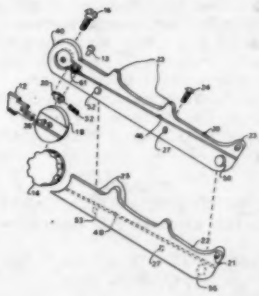
FOLDABLE POCKET SAW

William B. Korb, Melrose, Conn., and Paul W. Koetsch, Springfield, Mass., assignors to American Saw & Mfg. Company, East Longmeadow, Mass.

Filed Jan. 27, 1989, Ser. No. 302,376

Int. Cl.[5] B26B *3/06*

U.S. Cl. 30—161 **5 Claims**



1. A foldable pocket saw comprising a handle, a discrete rotatable member including a plurality of circumferentially spaced, radially extending notches in the periphery thereof rotatably disposed on a mounting head which extends out-

wardly of one end of the handle, a fastener for removably affixing a conventional saw blade onto said rotatable member, a spring actuated detent mechanism disposed within the handle and comprising a spring loaded pawl movable within the handle and in generally coplanar relationship with the rotatable member to engage selectively with one of the notches to prevent rotation of the rotatable member and thereby lock the saw blade in each of a plurality of positions relative to the handle.

4,918,821

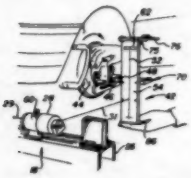
METHOD OF DETERMINING WHEEL ALIGNMENT

Bengt A. Bjork, Novato, Calif., assignor to Nicator AB, Sweden

Filed Jul. 15, 1988, Ser. No. 219,374

Int. Cl.[5] G01B *11/00, 11/26*

U.S. Cl. 33—203.18 **17 Claims**



1. A method of determining wheel alignment for the wheels of an automobile where a body of the automobile is clamped on a chassis straightening/measuring bench comprising the steps of:

determining a centerline and datum plane for the automobile;

calibrating a measuring system to the centerline and datum plane whereby a laser beam is projectable by the measuring system parallel to the centerline in the datum plane and wherein the projection of the laser beam is movable by the calibrated measuring system to selected positions in the datum plane and in a plane perpendicular to the datum plane;

lifting the front suspension of each front wheel hub relative to the bench until the associated wheel hub is at the normal ride height relative to the datum plane;

mounting a wheel alignment measuring unit having a plurality of association sales to each front wheel hub;

measuring the camber of each front wheel hub while the wheel hub is lifted by projecting the laser beam onto a predetermined camber scale of the measuring unit;

measuring the caster of each front wheel hub while the wheel hub is lifted by projecting the laser beam onto a predetermined caster scale of the measuring unit;

measuring the SAI/KPI of each front wheel hub while the wheel hub is lifted by projecting the laser beam onto a predetermined SAI/KPI scale of the measuring unit;

measuring the toe of each front wheel hub while the wheel hub is lifted by projecting the laser beam onto a predetermined toe scale of the measuring unit; and

measuring the TOOT of each front wheel hub while the wheel hubs are lifted by projecting the laser beam onto a predetermined TOOT scale of the measuring unit.

4,918,822

PERSPECTIVE DRAFTING APPARATUS

Semond Levitt, 1835 Lippincott Rd., Huntingdon Valley, Pa. 19006

Filed May 15, 1989, Ser. No. 351,790

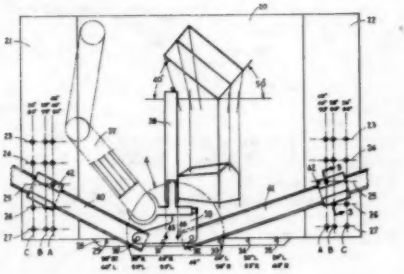
Int. Cl.[5] B43L *13/14*

U.S. Cl. 33—432 **11 Claims**

1. For use with a drafting apparatus for developing accurate perspective views from plan views of objects, wherein the drafting apparatus is of the type including a normally rectangular drafting board having upper and lower edges and left and right side edges, and a drafting machine movably affixed to the drafting board, the drafting machine having a vertical scale and a pair of left and right straight edges extending laterally in opposite directions from the vertical scale, the improvement comprising,

(a) a pair of left and right vanishing point guides within which each of the left and right straight edges is respectively slidable,

(b) left and right vanishing point guides positioning means for coupling said left and right vanishing point guides to the drafting board respectively at the left and right marginal areas thereof for pivoting movement with respect to the latter in a plane parallel to the plane of the drafting board upper surface and about left and right axes orthogonal to said plane, said left and right vanishing point guides positioning means comprising first positioning means for respectively fixing said left and right pivoting movement



coupling axes of said vanishing point guides at at least one left and one right selectable point along at least a first line extending parallel to the lower edge of the drafting board, and

(c) first and second selectably coactable drafting machine vertical scale angular control means, said first vertical scale angular control means being fixedly positioned with respect to said vertical scale, and said second vertical scale angular control means including locating means for fixedly positioning said second angular control means at at least one point on a second line parallel to the lower edge of the drafting board, said vertical scale being fixed for pivoting movement in a plane parallel to the plane of the drafting board upper surface about an axis orthogonal to said plane when said first and second coactable angular control means are coactably associated.

4,918,823

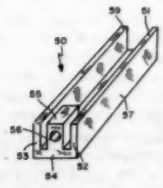
GUNSIGHT

Julio A. Santiago, 13713 Susan La., Burnsville, Minn. 55337

Continuation-in-part of Ser. No. 145,030, Jan. 19, 1988. This application Jul. 1, 1988, Ser. No. 214,726

Int. Cl.[5] F41G *1/00*

U.S. Cl. 33—241 **6 Claims**



1. A sighting device for mounting on the top of a weapon comprising:

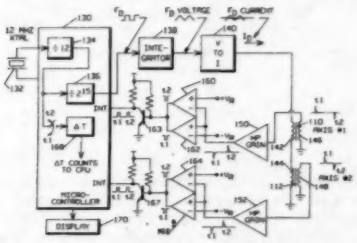
a channel member having a first sidewall extending upward;
a second sidewall extending upward from said channel member;
a sight post located between said first sidewall and said second sidewall wherein said sight post has an illuminated area to provide an illuminated sight and wherein said first sidewall has an interior light reflecting surface to reflect the light from said illuminated sight back to the user if the sight is not correctly aimed at an object and said second sidewall has an interior light reflecting surface to reflect the light from said illuminated sight back to the user if the sight is not correctly aimed at an object.

4,918,824

ELECTRONIC DIGITAL COMPASS

James G. Farrar, Lighthouse Point, Fla., assignor to International Navigation, Inc., Opa-Locka, Fla.

Filed Oct. 5, 1988, Ser. No. 253,780
Int. Cl.[5] G01C *17/30*
U.S. Cl. 33—361 **39 Claims**



1. An apparatus for sensing a magnetic field, comprising in combination:
a magnetostrictive core which exhibits reentrant behavior;
driving means for inducing said reentrant behavior by exposing said core to a drive magnetic field; and
sensing means for sensing a change in magnetic flux in the form of a pulse occurring when said core exhibits said reentrant behavior as a result of exposure to said drive magnetic field and said magnetic field.

4,918,825

MICROMETER CARTRIDGE HEADSPACE GAUGE

Stephen S. Lesh, 28459 Siesta La., Eugene, Oreg. 97402, and Herman J. Waske, 2602 Sorrel Way, Eugene, Oreg. 97401

Filed Jan. 23, 1989, Ser. No. 299,477
Int. Cl.[5] G01B *5/00*
U.S. Cl. 33—506 **3 Claims**

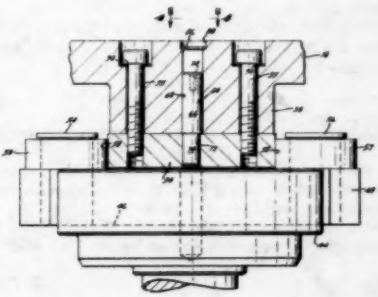
1. A firearm cartridge headspace gauge comprising;
a hollow gauge barrel having a central axis,
said barrel formed internally to conform precisely to the external physical dimensions of a given firearm cartridge caliber and type,
a barrel head sharing said central axis, said barrel head contains an internally threaded portion formed to precisely match and secure to an externally threaded portion of said gauge barrel,
said barrel and said barrel head contain external means indicating headspace of a cartridge contained therein, said external indicating means comprises a vernier scale in the manner of a micrometer scale disposed about the periphery of said barrel and said barrel head.

4,918,826

INDEX TABLE AND METHOD OF ALIGNMENT

Bruce L. Moore, Farmington Hills, and Graham D. Cottam, Novi, both of Mich., assignors to H. R. Kroeger Machine Tool Inc., Farmington, Mich.

Filed Aug. 30, 1988, Ser. No. 238,324
Int. Cl.[5] G01B *5/25*
U.S. Cl. 33—645 **3 Claims**



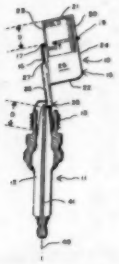
1. A method of accurately aligning a fully assembled powered index table mounted on a base and having a predetermined number of stations about the periphery thereof, a drive means, a lock means for each station and an eccentric pin for locating each lock means relative to the table, the method comprising the steps of:
(a) measuring the linear deviation of each station from the desired precise location thereof;
(b) fabricating a new eccentric pin for each station having an eccentricity chosen to eliminate said deviation at said station; and
(c) for each deviant station loosening said lock means, replacing the original eccentric pin with said new eccentric pin and retightening said lock means, without disassembling said table from said base.

4,918,827

DEVICE FOR DETERMING THE OPERATING TEMPERATURE RANGE OF A SPARK PLUG

John H. Orsos, Manuel Gonzales de la Rosa #473,, Lima 17, Peru

Filed Oct. 26, 1988, Ser. No. 262,689
Int. Cl.[5] G01B 5/02, 5/18
U.S. Cl. 33—836 4 Claims



1. A device for measuring the length of the conical surface of the ceramic insulator centered within the threaded sleeve of a spark plug, said device comprising:

(a) an elongated probe rod having upper and lower extremities,

(b) indicator means movably associated with said probe rod,

(c) a holder having retainer means which accommodates said probe rod in a manner to permit sliding movement of the probe rod in the direction of its axis, said retainer means having upper and lower extremities from which said probe rod protrudes, said lower extremity being configured as a narrow abutment tip,

(d) scale means adapted to interact with said indicator means,

(e) control means associated with the upper extremity of said probe rod, and

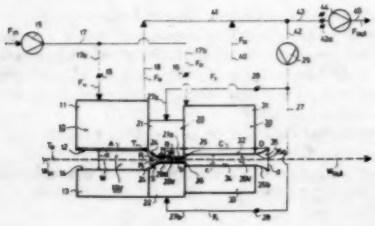
(f) a bent portion adjacent the upper extremity of said probe rod, said bent portion functioning as both control means and indicator means.

4,918,828

METHOD AND APPARATUS FOR DRYING A MOVING WEB

Reijo Ruotta; Raimo Rajala, both of Kaarina; Ilkka Jokioinen, and Sture Ahlskog, both of Lieto, all of Finland, assignors to Valmet Paper Machinery Inc., Finland

Filed Oct. 21, 1988, Ser. No. 261,161
Claims priority, application Finland, Nov. 2, 1987, 874805
Int. Cl.[5] F26B 3/28
U.S. Cl. 34—4 20 Claims



18. A method for drying a moving web comprising the steps of:

passing the web through a first infrared treatment gap of a first infrared dryer unit; and then

passing the web through a gas-support gap of a gas-support unit into which web-supporting gas blowings are directed on both sides of the web, said gas-support gap having a width less than the width of said first infrared treatment gap; and then

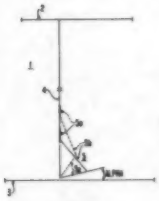
passing the web through a second infrared treatment gap of a second infrared dryer unit, said second infrared treatment gap having a width less than the width of said first infrared treatment gap and greater than said width of said gas-support gap of said gas-support unit.

4,918,829

FLUIDIZED BED FLIGHT APPARATUS

Gerald E. Harris, Haddonfield, N.J., assignor to Campbell Soup Corporation, Camden, N.J.

Filed Mar. 31, 1988, Ser. No. 176,233
Int. Cl.[5] F26B 17/18
U.S. Cl. 34—10 16 Claims



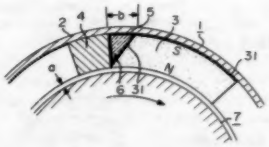
15. In a method of fluidizing particles in an indexing fluidized bed apparatus by introducing fluidizing medium into a confining vessel through a bottom through which fluidizing medium is introducible and distributible in an indexing fluidized bed apparatus to fluidize particles which are urged through the fluidizing medium by a flight, the improvement comprising preventing particles from escaping under the flight by imparting a horizontal velocity component to the fluidizing medium near the flight adjacent the bottom after the medium has been introduced into the vessel.

4,918,830

METHOD OF PREPARING A PERMANENT MAGNET DC MACHINE

Hiroaki Aso, Mitsubishi Denki Kabushiki Kaisha Himeji Seisakusho, 840, Chiyoda-cho, Himeji-shi, Hyogo-ken, Japan

Filed Mar. 21, 1989, Ser. No. 326,648
Claims priority, application Japan, Apr. 12, 1988, 63-89430
Int. Cl.[5] H02K 15/02
U.S. Cl. 29—596 11 Claims



1. A method of preparing a permanent magnet DC machine which comprises:

attaching by welding auxiliary magnetic poles having higher reversible permeability than that of main magnetic poles constituted by anisotropic permanent magnets which are

to be attached to the inner circumferential surface of a yoke;

joining a non-magnetic substance having a triangular shape in cross section to a side surface of each of said auxiliary magnetic poles and the inner circumferential surface of said yoke so as to form a leakage magnetic path breaking section at the radially outer part of each of said non-magnetic substances, the length of said leakage magnetic path breaking section being greater than the air gap formed between a rotor and a stator;

positioning said main magnetic poles of anistropic permanent magnets with respect to the other side surface of each of said non-magnetic substances and the inner circumferential surface of said yoke; and

fixing by an adhesive agent said main magnetic poles on the inner circumferential surface so as to adjoin said auxiliary magnetic poles through said non-magnetic substances.

4,918,831

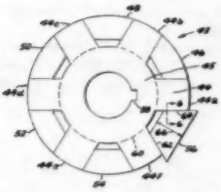
METHOD OF FABRICATING COMPOSITE ROTOR LAMINATIONS FOR USE IN RELUCTANCE, HOMOPOLAR AND PERMANENT MAGNET MACHINES

Gerald B. Klimaa, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 138,404, Dec. 28, 1987. This application Oct. 20, 1989, Ser. No. 424,438

Int. Cl.[5] H02K *15/02*

U.S. Cl. 29—598 **5 Claims**



1. A method for constructing a disk lamination for the rotor of a homopolar or switched reluctance magnetic machine comprising:

(a) providing a magnetic portion of a disk lamination having an interior core portion of uniform thickness and a plurality of pole pieces extending generally outward therefrom along respective radial lines so as to define an outer circumferential disk edge and form an interpole space, respectively, between each adjacent pair of said pole pieces, respectively;

(b) inserting the magnetic portion in a jig, the jig comprising a plurality of tables corresponding geometrically in location and configuration to the plurality of interpole spaces;

(c) positioning the magnetic portion such that the pole pieces are position Ⓡd between the plurality of tables;

(d) guiding a non-magnetic segment, respectively, into each interpole space, respectively, by sliding said segment along the top of the table until angularly opposed edges of the non-magnetic segment abut respective adjacent edges of the pole pieces adjacent thereto; and

(e) bonding the edges of the pole pieces to the abutting edges of the non-magnetic segments.

4,918,832

LAMINATED IRON CORE ASSEMBLING PROCESS

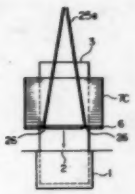
Osamu Tokumasu; Yoshihiro Kuzuba; Hiroti Suzuki, and Bunichiro Awata, all of Ako, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Feb. 24, 1989, Ser. No. 315,264

Claims priority, application Japan, Feb. 24, 1988, 63-39352

Int. Cl.[5] H01F *41/02*

U.S. Cl. 29—606 **10 Claims**



1. A process for assembling a laminated iron core on a support structure about an electrical coil from a plurality of lamination sections to form a shell-type transformer core comprising the steps of:

stacking a plurality of lamination sections on a support structure in a staggered relationship to form a first core section which has joint ends to form overlapping joints between an adjacent core section;

conveying said first core section onto said support structure at which a laminated iron core is to be assembled; and

assembling the plurality of lamination sections on site into a second core section which connects said joints ends of said first core section to define a magnetic circuit around said coil;

wherein said step of stacking said first core section comprises preparing a first support member, placing a slider sheet of a low coefficient of friction on said first support member, and stacking said lamination sections on said slider sheet; and

said conveying step comprises sliding and placing said first core section together with said slider sheet onto said support structure.

4,918,833

METHOD OF ASSEMBLING AN ELECTRONIC TRANSDUCER

John J. Allard, Morrison; Merle L. Kemp, Prophetstown, and Alan J. Janicek, Morrison, all of Ill., assignors to General Electric Company, Fort Wayne, Ind.

Filed Apr. 8, 1988, Ser. No. 179,202

Int. Cl.[5] G01L *7/08, 9/04*

U.S. Cl. 29—621.1 **25 Claims**

1. A method of assembling an electronic transducer having a collar with a flange thereon, a strain gauge having a flexible dielectric carrier, a dielectric casing member including at least one recess therein, and a set of terminals mounted to the dielectric casing member with each terminal having a supporting section within the at least one recess and an electrical connector section exteriorly thereof, a metallic casing member including at least one end face, a recess means for subjection to fluid pressure and defining with the at least one end face a flexible diaphragm therebetween adapted to be deflected upon the subjection of the recess means to fluid pressure, an electronic device having a plurality of solid state components associated in circuit relation, a set of electrical connector clips, and a set of contact blades, the method comprising the steps of:

adhering the carrier of the strain gauge to the at least one end face of the metallic casing member so that the strain gauge spans at least in part across the diaphragm so as to be conjointly flexible therewith;

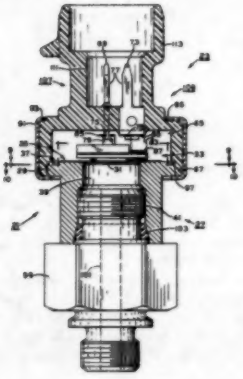
securing the electrical connector clips in preselected locations on the electronic device in circuit relation therewith;

connecting at least some of the electrical connector clips in circuit relation to the strain gauge;

disposing the electronic device in spaced apart relation adjacent the carrier with the solid state components being remote from the carrier during the connecting step;

mounting the contact blades to the supporting sections of the terminals with the contact blades extending in preselected locations from the supporting sections, respectively;

associating the dielectric casing member and the metallic casing member in a preselected assembly position with respect to each other so as to enclose the strain gauge, the electronic device, the contact blades, the electrical connector clips and the supporting sections of the terminals within the recess means of the dielectric component;



arranging the contact blades in circuit relation with respective ones of the electrical connector clips connected in circuit relation with at least the electronic device during the associating step;

placing the collar in part about the metallic casing member and the dielectric casing member with the flange on the collar being engaged with one of the dielectric casing member and the metallic casing member when the metallic casing member and the dielectric casing member are in the preselected assembly position thereof; and

deforming a part of the collar into displacement preventing engagement with the other of the dielectric casing member and the metallic casing member thereby to return the metallic and dielectric casing members in the preselected assembly position thereof.

4,918,834

ENVELOPE FOR PROTECTING DISASSEMBLED STATOR COIL

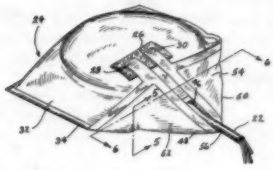
Daniel Klawitter, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Jan. 17, 1989, Ser. No. 297,990

Int. Cl.[5] B23P *19/04;* **B65D** *33/16*

U.S. Cl. 29—722 **12 Claims**

1. A repair aid for a two-cycle internal combustion engine having a crankshaft extending through a crankcase and through an alternator stator coil, said stator coil having electrical wires connected to said engine, said stator coil being removed from said crankshaft during repair to said engine and being subject to damage and abrasion during movement of said engine during repair while said stator coil dangles from said engine by said wires and is subject to striking miscellaneous objects in the immediate vicinity, said repair aid comprising a protective envelope enveloping said stator coil and having an opening therein through which said electrical wires pass such that said stator coil remains connected to said engine by said wires during said repair, wherein said protective envelope comprises a first portion enabling insertion of said stator coil with said wires attached and extending outwardly therefrom, and a second portion movable to close said first portion with said wires still extending outwardly therefrom to permit said stator coil to remain attached to said engine by said wires, and protect and envelope said stator coil during repair of said



engine without requiring removal of said wires from said engine, wherein said first portion of said envelope is a pocket, and said second portion of said envelope is a flap extending from said pocket and folded back onto said pocket with said stator coil therein and leaving an opening through which said wires extend, wherein said flap is folded along a pair of fold lines forming first and second folded flap portions defining a slit therebetween through which said wires extend, wherein said fold lines are on a single said flap in a single plane.

4,918,835

APPARATUS FOR COMPLETING A LINEAR MOTOR STATOR

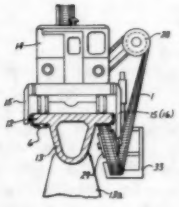
Manfred Weisio; Hans G. Raschbichler; Luitpold Miller, all of Ottobrunn, and Otto Breitenbach, Nuremburg, all of Fed. Rep. of Germany, assignors to Kabelmetal Electro GmbH, Hanover and Thyssen Industrie AG, Essen, both of, Fed. Rep. of Germany

Division of Ser. No. 268,232, Nov. 7, 1988, Pat. No. 4,860,030. This application May 23, 1989, Ser. No. 356,760

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1987, 3737719

Int. Cl.[5] H02K *15/085*

U.S. Cl. 29—732 **5 Claims**



1. Apparatus for providing a multiphase winding into the grooves of a stator of a linear motor, the stator being mounted with open grooves facing down, on the underside of a support and carrier plate being carried in an elevated position, comprising in combination,

a plurality of individually reelable stores provided for individual payout of cable from respective ones of said stores;

means for meander shaping the individual cables;

a conveyor belt means provided on the vehicles for moving individual and spaced apart holding elements towards a particular area;

mains in said particular area of the vehicle for placing the holding elements as provided by the conveyor belt onto

portions of the meandering cables as arriving in the particular area;

means on the vehicle for connecting said holding elements together thereby forming a winding package; and

an outrigger boom for receiving said winding package as assembled and placing it within reach of a tool by means of which the portions of the cable holding said holding elements are forced into stator grooves.

4,918,836

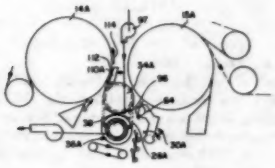
TAIL CUTTER APPARATUS AND METHOD

Gregory L. Wedel, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Continuation-in-part of Ser. No. 14,569, Feb. 13, 1987. This application Aug. 23, 1988, Ser. No. 235,394

Int. Cl.[5] F26B *5/00*

U.S. Cl. 34—23 **23 Claims**



23. A method for cutting a tail from a web extending through a single tier section, said method comprising the steps of:

guiding the web and felt extending contiguously with the web around a dryer of the dryer section such that the web is disposed between a felt and the dryer for drying the web;

guiding the felt around a felt roll disposed downstream relative to the dryer;

guiding the web from the felt roll to and around a guide roll disposed downstream relative to the felt roll;

guiding the web back towards the felt roll such that a first and second open draw of the web are defined between the felt roll and the guide roll;

pivoting a cutting device into operative cutting cooperation with the web for cutting the tail from the web during movement of the web through one of the open draws; and

guiding the web and felt contiguously from the felt roll to and around a further dryer disposed downstream relative to the dryer.

4,918,837

DEVICE FOR GENERATING A CONTINUOUS STREAM OF DRIED GASES

Roderich W. Gräff, Engerländer Str. 2 - 4, 6108 Weiterstadt 2, Fed. Rep. of Germany

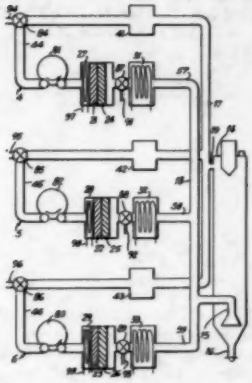
Filed Feb. 15, 1985, Ser. No. 703,213

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1984, 3405260

Int. Cl.[5] F26B *21/06*

U.S. Cl. 34—80 **6 Claims**

1. A device for the generation of a continuous stream of dried gas, preferably air, comprising a drying hopper containing a material to be dried; a plurality of containers containing adsorption means therein; a plurality of conduits connected to said drying hopper and being at times switchable-off, and a plurality of blowers; said blowers, said conduits and said containers being combined into a number of groups of equal size and including one of said blowers, one of said conduits and one of said conduits, said groups being interchangeable with each other and removable from the device and connectable immediately to said drying hopper via a respective conduit, each container in each of said groups being immediately coupled to an assigned blower, and wherein the adsorption means of each



container is intermittently passed through by a heated-up regeneration gas.

4,918,838

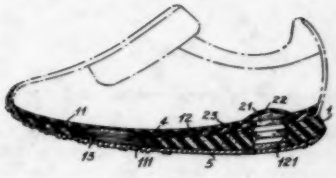
SHOE SOLE HAVING COMPRESSIBLE SHOCK ABSORBERS

David J. H. Chang, Taichung, Taiwan, assignor to Far East Athletics Ltd., Taipei, Taiwan

Filed Aug. 5, 1988, Ser. No. 228,458

Int. Cl.[5] A43B *13/20, 21/26*

U.S. Cl. 36—28 **12 Claims**



1. A shoe sole unit with compressible shock absorbers comprising:

shock absorbers which comprise a replaceable generally cylindrically-shaped air cylinder installed at the heel, and a replaceable polygonal-shaped air bellows at the forefoot portion respectively;

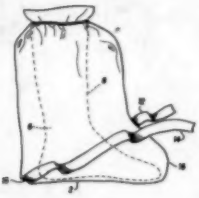
a sole unit which provides on the forefoot and the heel portion a suitable recess for receiving each of said replaceable shock absorbers; and

a removable innersole pad disposed above said sole unit and said replaceable shock absorbers thereby obtaining a shock absorbing shoe sole unit with that also provides energy return, and motion control.

4,918,839
SANITARY SHOE COVER

Bobby C. Brandon, Columbus, Miss., assignor to Teknamed Corporation, Columbus, Miss.

Filed Nov. 22, 1988, Ser. No. 274,487
Int. Cl.[5] A43B *3/16*
U.S. Cl. 36—7.1 R 5 Claims



1. A shoe cover, comprising:

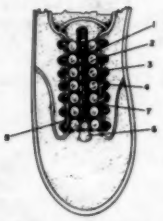
a pair of substantially flat sheets of material secured together along peripheral edges thereof and forming a substantially straight edged bottom portion, a deformable heel portion, a toe portion, an instep portion and having an opening formed at an upper portion of the flat sheets;

at least one securing strip means secured to said heel portion and securable around said instep portion for selectively adjusting a length dimension of said bottom portion and for securing said flat sheets of material to a shoe wherein said heel portion comprises a rear corner portion of said flat sheets of material.

4,918,840
FOOTWEAR FASTENER

Elisa Nardulli, 4828 Denney Ave., North Hollywood, Calif. 91601

Filed Jan. 26, 1989, Ser. No. 301,847
Int. Cl.[5] A43B *11/00, 11/12*
U.S. Cl. 36—50 1 Claim



1. Apparatus for tightening shoes, which comprises:

a. a zipper;

b. buttons, sewn to the top surface of the zipper; and

c. elastic loops, sewn to the zipper, which loop through the existing eyelets of a shoe and loop around the buttons.

4,918,841
ATHLETIC SHOE WITH IMPROVED MIDSOLE

Jerome P. Turner, 25742 Buckles Bucklestone Ct., Laguna Hills, Calif. 92653, and John W. Thomas, 36 Christamon W., Irvine, Calif. 92714

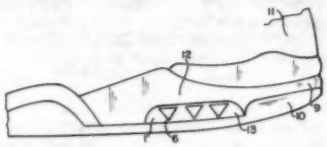
Filed Jan. 30, 1989, Ser. No. 303,945
Int. Cl.[5] A43B *13/14, 13/18, 13/04*
U.S. Cl. 36—114 7 Claims

1. An athletic shoe comprising an upper shoe connected to a multilayer sole, said multilayer sole comprising in combination:

(a) an inner sole;

(b) an outer sole;

(c) a midsole intermediate between said inner and outer sole, said midsole having a cavity which is provided with a resilient member said resilient member comprising a first module having one or more parallel grooves which in cross-section have a triangular profile and a second module having one or more parallel raised strips which in cross-section have a

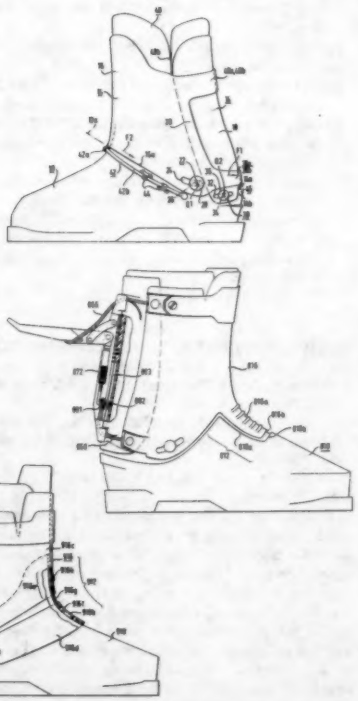


triangular profile, said second module being joined to said first module by insertion of the raised strips of said second module into the grooves of said first module, and said joined first and second modules being located in said cavity of said midsole.

4,918,842
SKI BOOT

Josef Lederer, Jetzendorf, Fed. Rep. of Germany, assignor to Salomon S.A., Annecy Cedex, France

Continuation of Ser. No. 53,827, May 26, 1987, Pat. No. 4,759,137, which is a continuation of Ser. No. 926,100, Nov. 3, 1986, abandoned, which is a continuation of Ser. No. 815,177, Dec. 20, 1985, abandoned, which is a continuation of Ser. No. 561,635, Dec. 15, 1983, abandoned. This application Apr. 20, 1988, Ser. No. 184,014
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1982, 3247516
The portion of the term of this patent subsequent to Feb. 25, 2003, has been disclaimed.
Int. Cl.[5] A43B *5/04*
U.S. Cl. 36—117 19 Claims



1. A ski boot comprising:

(a) a toe-and-heel-portion having a sole portion and instep portion;

(b) an anklet front portion and an anklet rear portion; each of said two anklet portions being pivotally mounted on said toe-and-heel-portion, whereby said anklet portions are pivotally movable between an open position, which allows a person's foot to be inserted into the boot, and a closed position, in which said anklet portions may be brought together to close about a person's ankle;

(c) an upper closing device positioned on an upper portion of at least one of said two anklet portions; and

(d) a lower tightening means positioned on a lower portion of at least one of said two anklet portions for applying a force against a person's foot located within said boot;

wherein said lower tightening means and said upper closing device comprise means that extend substantially horizontally across a back portion of said rear anklet portion.

4,918,843

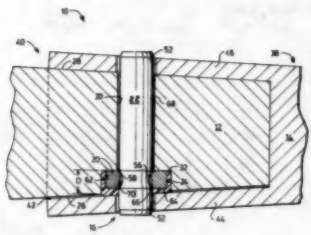
GROUND ENGAGING TOOL

Martin V. Kiesewetter, Morton, and William J. Renski, Peoria, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Feb. 21, 1989, Ser. No. 313,278

Int. Cl.[5] E02F *9/28*

U.S. Cl. 37—142 A **6 Claims**



1. A ground engaging tool having an adapter nose, a ground engaging tip mounted on the adapter nose, and a tip retainer mechanism for retaining the tip on the adapter nose, said adapter nose defining a transverse bore extending between first and second sides thereof, said tip defining a cavity operative to mate with the adapter nose and a pair of laterally spaced holes in first and second sidewalls thereof, and a recess defined in one of the first and second sides of the adapter nose or one of the first and second sidewalls of the tip and in axial alignment with the respective one of the transverse bore or the laterally spaced holes, the recess has a predetermined depth, when assembled the laterally spaced holes, the recess, and the transverse bore are in substantial axial alignment, the ground engaging tool comprising:

a generally annular split spring retainer disposed in the recess, said spring retainer defining a bore therein;

a holder defining a receiving opening therein, said holder being disposed in the recess and encircles the spring retainer, the holder having an axial thickness greater than the depth of the recess and being operative to provide a snug fit between the tip and adapter nose to substantially eliminate excessive vibrations of the tip on the adapter; and

a pin having a diameter larger than the diameter of the bore in the retainer, said pin being disposed in the transverse bore, the laterally spaced holes, and the spring retainer, said pin being held in place by a mechanical fit between the pin and the spring retainer.

4,918,844

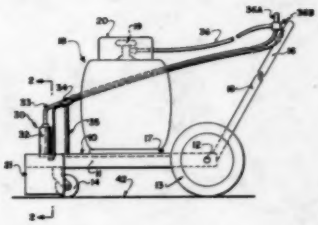
MAINTAINING AN ICE RINK ADJACENT A SIDE EDGE

Frederick J. Marsh, 3 Dunn Street, Kitimat, British Columbia, Canada (V8C 1C6)

Filed Jul. 14, 1989, Ser. No. 379,986

Int. Cl.[5] E01H *5/10*; F23C *5/14*

U.S. Cl. 37—197 **17 Claims**



1. A method of maintaining an ice rink of the type used for sporting activities comprising a horizontal ice surface and a substantially vertical side surface defining an edge of the ice surface, the method comprising applying heat to the ice surface solely adjacent the edge so as to cause melting of the ice at the edge, and moving the application of heat along the edge so as to apply the heat in a narrow strip along the edge.

4,918,845

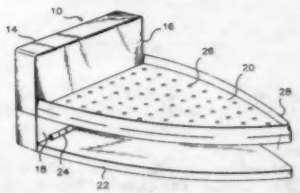
CLAMP TYPE ELECTRIC STEAM IRON STAND

Paul M. Livecchi, P.O. Box 27171, San Diego, Calif. 92128

Filed Nov. 21, 1988, Ser. No. 273,994

Int. Cl.[5] D06F *75/08, 75/40*

U.S. Cl. 38—142 **4 Claims**



1. An electric iron stand comprising:

a vertically oriented rear wall member having a top edge, a bottom edge and a front wall surface, said rear wall member having a top portion and a bottom portion;

a horizontally oriented electric iron support platform having a front end and a rear end, the rear end of said support platform being rigidly attached to the front wall surface of said rear wall member at a height intermediate its top portion and its bottom portion, said electric iron support platform having resilient bevel contoured side wall flanges extending upwardly from its lateral sides for detachably capturing an electric iron therebetween; and

an elongated clamping leg having a front end and a rear end, said rear end being secured to the front wall surface of said rear wall member adjacent its bottom edge.

4,918,846

DUST SEAL FOR A LINEAR GUIDE APPARATUS

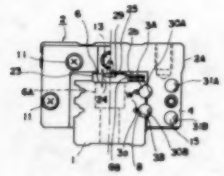
Toru Tsukada, Gumma, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 23, 1988, Ser. No. 276,159

Claims priority, application Japan, Nov. 24, 1987, 62-178543[U]

Int. Cl.[5] F16C *29/06, 29/08*

U.S. Cl. 384—15 **1 Claim**



1. A dust seal of a linear guide apparatus, wherein said linear guide apparatus comprises an axially extending guide rail having a bolt inserting hole for securing said guide rail to a base, axially extending ball rolling grooves formed in both side surfaces of said guide rail, and a slider having ball rolling grooves respectively opposing to said ball rolling grooves of said guide rail and supported on said guide rail, movably in the axial direction, by rolling balls inserted in said ball rolling grooves, said dust seal comprising:

a side seal member attached to each axial end of said slider, having seal protrusions for sliding contact with surfaces of said ball rolling grooves, and having a void portion at a position corresponding to an opening of a bolt inserting hole in the upper surface of said guide rail;

an upper seal member attached to an upper inner surface of said slider opposing axially extending flat ridge portions of said upper surface of said guide rail adjacent to said opening of said bolt inserting hole, said upper seal member being bent to have a cross section which provides a resilient property; and

a pair of seal plates secured to wing portions of said upper seal member for resilient contact with said flat ridge portions of the guide rail, thereby preventing intrusion of foreign particles into said ball rolling grooves.

4,918,847

COMBINED DISPLAY BOARD AND CLIP

Yeou-Ching Lee, Taipei, Taiwan, assignor to Alvin Lee Jewelry, Inc., Taipei, Taiwan

Filed Nov. 2, 1988, Ser. No. 265,996

Int. Cl.[5] G09F *1/12*

U.S. Cl. 40—152.1 **18 Claims**

1. A combined display board and clip comprising:

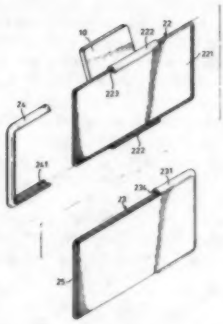
a first clamping member,

a second clamping member,

means for connecting said first and second clamping members in a pivotal position, and

spring means for urging said first clamping member to a clamping position with respect to said second clamping member,

wherein at least one of said first and second clamping members is a display board which includes a base plate having opposite edges, a cover plate having opposite edges, and an edge-piece means having a groove means for releaseably receiving and clamping together said edges of said cover plate and said base plate, and wherein said display board is rectangular, said edge-piece means extending along the edges of said display board and including two opposite U-shaped edge segments, one of said edge segments being formed integrally with said cover plate, the



other one of said edge segments being a separate piece from said cover plate and said base plate.

4,918,848

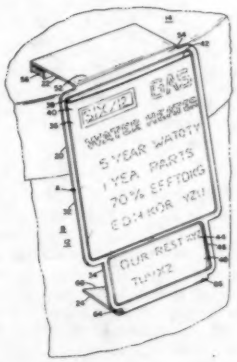
DISPLAY STAND FOR USE WITH WATER HEATERS

Geoffery Stein, Solon, Ohio, assignor to Mor-Flo Industries, Inc., Cleveland, Ohio

Filed Nov. 9, 1988, Ser. No. 268,757

Int. Cl.[5] G09F *7/00*

U.S. Cl. 40—584 **7 Claims**



1. A display stand for use on water heaters comprising:

a single piece of rigid plastic sheet formed with a generally flat front first panel having a top edge, a bottom edge, a front surface adapted to display information, and a rear surface;

a generally flat imperforate top second panel immovably extending directly and rearwardly from said first panel and having a front edge rigidly fixed to said first panel top edge, a rear edge, a top surface, and a bottom surface with attachment means fixed thereon adapted to engage the top of a water heater, said second panel forming a fixed obtuse angle with the portion of said first panel extending therebelow; and

a generally flat bottom third panel immovably extending directly and rearwardly from said first panel and having a front edge rigidly fixed to said first panel bottom edge and a rear edge, said third panel forming a fixed acute angle with the portion of said first panel extending thereabove;

and said third panel rear edge being concave for engagement with the cylindrical side wall of the water heater to maintain the lower end of the display stand in lateral position thereon.

4,918,849

MUZZLE-LOADING FIREARM

Angel H. L. Spota, 1808 Old Meadow Rd., McLean, Va. 22102

Filed Apr. 27, 1989, Ser. No. 343,589
Int. Cl.[5] F41C *27/00*
U.S. Cl. 42—51 **4 Claims**

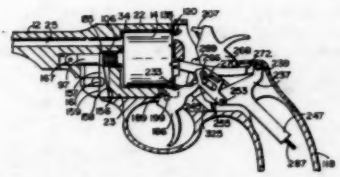
1. A muzzle-loading firearm comprising:
a stock;
a barrel integral with or fastened to said stock, said barrel having an opening of substantially constant cross-section extending longitudinally within said barrel from a muzzle end of said barrel toward a breach end of said barrel and a longitudinally extending chamber at said breach end of said barrel, said chamber having a larger cross-sectional area than that of said opening;
closing means for closing said chamber at said breech end of said barrel, said closing means being integral with or fixed to said barrel at said breech end thereof;
lock means operably connected to said chamber for igniting a charge in said chamber; and
detaining means for preventing a projectile inserted in said opening of said barrel from entering said chamber.

4,918,850

GAS SEAL REVOLVER

Jens O. Rick, 220 Sanborn, Big Rapids, Mich. 49307

Continuation of Ser. No. 135,055, Dec. 18, 1987, abandoned. This application Mar. 6, 1989, Ser. No. 319,928
Int. Cl.[5] F41C *1/02*
U.S. Cl. 42—59 **26 Claims**



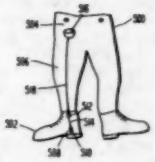
1. A gas seal revolver comprising:
a frame;
a barrel having a longitudinal bore extending therethrough with forward and rearward ends, and a first seal element extending about a marginal portion of said rearward end of said bore;
means for mounting said barrel on said frame to permit longitudinal motion therebetween;
a cylinder positioned adjacent and operably supported on said barrel, said cylinder having a plurality of parallel chambers, adapted to receive cartridges therein, with ends which open toward said barrel and a second seal element extending about a marginal portion of each said chamber end and shaped to engage said first seal element and therewith form a leak-resistant gas seal; and
means for shifting said barrel between a firing position wherein said first and second seal elements are engaged to seal said barrel bore and said cylinder chamber for increased projectile speed, and a rest position wherein said first and second seal elements are disengaged to permit said cylinder and said barrel to move with respect to one another;
said barrel further being pivotally mounted on said frame to permit said barrel and said cylinder to tip open on said frame to facilitate reloading and cleaning of said revolver.

4,918,851

TEMPERATURE MEASUREMENT APPARATUS FOR USE IN RECREATIONAL AND SPORTING ACTIVITIES

Aaron J. Peikin, 315 N. Wayne Ave., Wayne, Pa. 19087

Continuation-in-part of Ser. No. 266,884, Nov. 3, 1988, Pat. No. 4,864,763, which is a continuation-in-part of Ser. No. 922,876, Oct. 24, 1986, Pat. No. 4,782,617. This application Jun. 12, 1989, Ser. No. 365,173
Int. Cl.[5] A43B *1/10*
U.S. Cl. 43—1 **12 Claims**



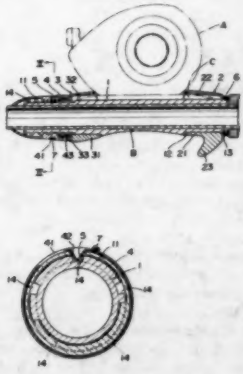
1. A wader comprising:
(a) at least one foot portion having disposed thereon a temperature sensing means;
(b) a torso portion having disposed thereon a temperature measurement display means;
(c) an electrical power source;
(d) means for electrically interconnecting said temperature sensing means, said temperature measurement display means, and said electrical power source.

4,918,852

FIXTURE FOR A FISHING REEL

Yoshiro Yamato, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Jun. 19, 1989, Ser. No. 367,679
Claims priority, application Japan, Jun. 21, 1988, 63-82135[U]
Int. Cl.[5] A01K *87/06*
U.S. Cl. 43—22 **4 Claims**



1. A fixture for a fishing reel, comprising:

a tubular fixture body having a screw thread disposed at an outer periphery of one lengthwise end thereof;

a fixing holder fixed to another lengthwise end of said fixture body;

a movable pusher positioned at one side of said fixture body and supported to said fixture body to be movable toward or away from said fixing holder; and

a threaded ring screwable with said screw thread to operate said movable pusher to undergo movement toward or away from said fixing holder, said screw thread being provided with a plurality of locking grooves each extending lengthwise of said fixture body, said plurality of locking grooves being spaced apart circumferentially around said fixture body, said threaded ring being provided with at least one engaging projection selectively engageable one at a time with said plurality of locking grooves to restrain said threaded ring from loosening relative to said movable pusher, said engaging projection being changeable in position between an engaging position where said engaging projection engages with one of said locking grooves and a disengaging position where said engaging projection disengages from one of said locking grooves.

4,918,853

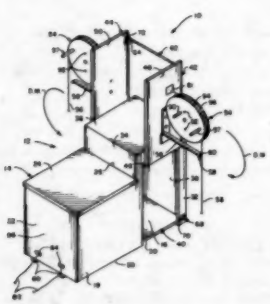
PORTABLE, COLLAPSIBLE ICE FISHING DEVICE

Charles A. Bascom, and Betty A. Bascom, both of R.R. #1, Box 37, Elmira, Mich. 49730

Filed Jan. 5, 1989, Ser. No. 293,762

Int. Cl.[5] A01K *97/08*

U.S. Cl. 43—26 **14 Claims**



1. A portable, collapsible ice fishing device for carrying and storing goods in one configuration and for supporting a fisherman and his equipment in another configuration, comprising:

(A) a monolithic frame having

(i) a hollow seat section which is adapted to store goods and which comprises

(a) side walls,

(b) a bottom, and

(c) a seat portion on which a fisherman sits,

the seat section being sized to fit between the fisherman's legs and extend in the posterior/anterior direction with respect to such fisherman when he sits on the seat portion in straddle-fashion;

(ii) a hollow storage section which is adapted to store goods and which comprises

(a) a front wall,

(b) a rear wall located adjacent to said seat portion,

(c) two side walls each forming a continuation of one of said seat section side walls,

(d) a bottom,

(e) each storage section side wall having a door opening defined therein for providing access inside the frame,

(f) a door hingeably attached to each storage section side wall go cover the door opening in such side wall, each door having an inside surface which is located inside the storage section when the door is closed to face the inside surface of the other door, and an outside surface that is outside the storage section when the door is closed to face in a direction opposite to the outside surface of the other door,

(g) hinge means hingeably connecting each door to a storage section side wall and permitting such hingeably connected door to swing from a first position covering the door opening associated therewith with the door inside surface facing towards the inside of the storage section and towards the inside surface of the other door 180° to a second position which is upright with respect to the storage section bottom and with the door inside surface facing outwardly with respect to the storage section inside and in a direction opposite to the inside surface of the other door so that the door outside surfaces face each other,

(h) a top surface on said storage section, with the doors extending above said top surface in the second position,

(i) a fishing reel element mounted on the inside surface of each door,

(j) a flexible bobber element mounted on the inside surface of each door to be adjacent to the fishing reel mounted on such door,

(k) a connecting rod pivotably mounted on the outside surface of one of said doors,

(l) rod attaching means mounted on the outside surface of the other door to releasably affix the connecting rod to such other door and connect the doors together, said rod and said rod attaching means being located to be positioned above the storage section top surface when the doors are in the second position,

(m) a closure latch element mounted on each door, and

(n) a closure latch receiving element mounted on each storage section side wall to receive the closure latch element associated therewith;

(iii) means connecting the inside of the hollow storage section to the inside of the hollow seat section; and (B) skid means mounted on the seat section bottom and storage section bottom for facilitating the sliding movement of said frame over ice and snow.

4,918,854

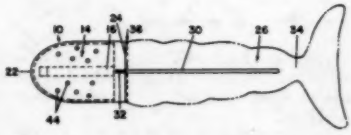
REMOVABLY ATTACHABLE NOISE MAKING LURE ADDITION APPARATUS AND METHOD

Jerome B. Webre, Jr., 5252 Twin City Hwy., #465, Groves, Tex. 77619

Filed Oct. 3, 1988, Ser. No. 251,805

Int. Cl.[5] A01K *85/00*

U.S. Cl. 43—42.31 **9 Claims**



1. A removably attachable noise making lure addition comprising:

A. a hollow containment means;

B. a weight receiving channel means in said hollow containment means through which weight and noise means are introduced and extracted, said channel means in a base of said hollow containment means to which a hook is removably attached;

C. a removably attachable eye means, that seals said weight

receiving channel means, and to which fishing line is attached;

D. a hook receiving means in said hollow containment means for removably attaching fishing hooks;

E. a conically shaped hollow outer frame of said hollow containment means;

F. a rigid center section of said frame through which said weight receiving channel passes and into which said removably attachable eye means is secured; and

G. a base of said conically shaped frame to which said hook and a fish attracting means are attached.

4,918,855

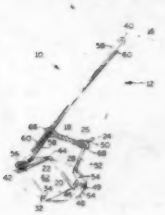
TRAP FOR CATCHING ANIMALS

Davis W. Simpson, 2819 Whisper Path, San Antonio, Tex. 78230

Filed Apr. 20, 1987, Ser. No. 40,082

Int. Cl.[5] A01M *23/24*

U.S. Cl. 43—85 **11 Claims**



1. An animal trap comprising:

first and second arms;

edible means for holding said first and second arms in a first open position;

biasing means for biasing said first and second arms toward a second closed position; and

engaging means formed in each of said first and second arms for engaging a portion of the body of an animal after the animal breaks said edible means, said engaging means further comprising a base jaw and a spring jaw, a first end of said base jaw and a first end of said spring jaw being integral with said biasing means, said spring jaw further comprising a latch formed at a second end thereof.

4,918,856

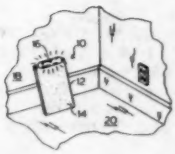
INSECT TRAP FOR FLEAS OR THE LIKE

Billy B. Olive, Rte. 1, Box 166, Durham, N.C. 27705, and Clarence O. Williams, 3617 Sheffield Dr., Rocky Mount, N.C. 27801

Filed May 24, 1989, Ser. No. 357,048

Int. Cl.[5] A01M *1/04*

U.S. Cl. 43—113 **20 Claims**



1. A trap for catching insects, comprising:

(a) insect trapping means comprising a sticky landing surface and means to support said sticky landing surface in a position accessible to live insects to be trapped and killed by contacting said surface; and

(b) a self-contained, gradually decaying, radiant light source continuously operative independent of a combustible fuel or electrical energy supply and positioned proximate said insect trapping means to provide a luring color of light uniquely suited to attracting the insects to be trapped to said sticky landing surface.

4,918,857

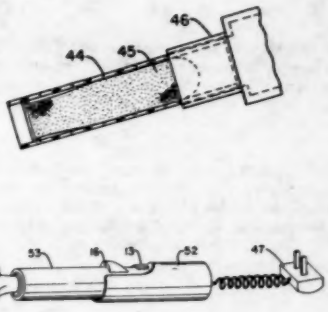
PEST COLLECTION AND DISPOSAL DEVICE

Bill R. Wade, and Thelma L. Wade, both of Farmington, Wash., assignors to Bilou, Inc., Farmington, Wash.

Continuation-in-part of Ser. No. 96,371, Sep. 11, 1987. This application Jul. 27, 1988, Ser. No. 225,046

Int. Cl.[5] A01M *1/06*

U.S. Cl. 43—139 **6 Claims**



1. An improved pest collection device consisting of an expandible and retractable array of interconnected, hollow duct members, at least one of said a duct members is adapted for sliding telescopic motion, said duct members positioned at least partly in an adjacent member to vary the length of the array, at least one of said duct members having an electric power supply compartment, a motor fan compartment, and an insect collection compartment wherein said collection compartment has a disposable-replaceable cartridge means which comprises: an elongated hollow body having inlet and outlet ends, a flexible closure member positioned at said inlet end and is deflectable to provide an entrance to the hollow body when an air stream flows therein, and a filter means positioned adjacent said outlet end of said hollow body through which said air stream flows for removing a pest entrained in said air stream;

whereby, the disposable cartridge enables pests to be collected and disposed of without presenting an unsanitary, or unsightly condition, as well as inhibiting escape of insects from within the cartridge during disposal, each of said compartments arranged to enable air to flow into said device at an inlet of said insect collection compartment and flow to said motor fan compartment and to be exhausted from said array.

4,918,858

MULTIPLE PURPOSE FISHING DEVICE

Marvin L. Maxfield, Sr., 609 Greenwood, #4, Wichita, Kans. 67211

Filed Jun. 12, 1989, Ser. No. 364,880

Int. Cl.[5] A01K *97/00*

U.S. Cl. 43—17.2 **18 Claims**

1. A fishing accessory comprising:

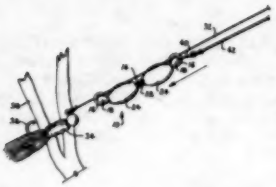
a substantially straight pin element having opposite ends;

a loop on one end of said pin element, said loop being arranged to present an eye and a gap in the eye providing access thereto;

a weight received on said pin element for axial sliding movement thereon toward and away from said loop;

a second weight on said pin element at a location spaced away from the first mentioned weight; and

retaining means comprising a compression spring com-



pressed between said first and second weights and acting to urge the first weight toward said loop, said spring being yieldable to permit movement of the first weight away from the loop to open said gap.

4,918,859

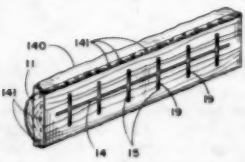
STRUCTURE FOR GROWING MUSHROOMS

Thomas S. Shevlin, Rt. 1, Box 139, Lower Salem, Ohio 45745

Continuation of Ser. No. 63,030, Jun. 17, 1987, abandoned. This application Oct. 28, 1988, Ser. No. 263,971

Int. Cl.[5] A01G *1/04*

U.S. Cl. 47—1.1 **14 Claims**



1. A structure for growing forest mushrooms comprising:

a slab wood log having a longitudinal cut face and a bark back;

a recess located in said cut face for receiving mushroom spawn;

mushroom spawn located on the longitudinal cut face of said slab wood log; and

a sheet of flexible film material extending over said cut face.

4,918,860

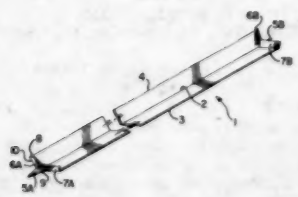
TREE BRANCH SPREADER

Dennis Breadner, R.R. #1, Clarksburg, Ontario N0H 1J0, Canada

Filed May 9, 1989, Ser. No. 349,491

Int. Cl.[5] A01G *17/04*

U.S. Cl. 47—42 **5 Claims**



1. A fixed length tree spreading device comprising a shaft provided with engagement means at each of its ends, wherein the shaft comprises an elongate member of thin sheet strip having an L-cross section in which each limb of the L-cross section is approximately the same length and wherein the included angle between the limbs is from about 90° to about 100°; and wherein each engagement means comprises two upstanding tabs, one on each limb of the L-cross section, together with a short protruding spike member therebetween substantially in line with the angle of the shaft.

4,918,861

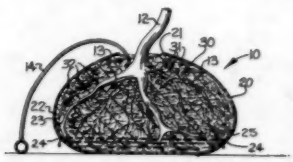
PLANT GROWTH BED WITH HIGH LOFT TEXTILE FIBERS

Tim D. Carpenter, Colorado Springs, Colo., and Claude C. Hobbs, Waco, Tex., assignors to Hobbs Bonded Fibers, Groesbeck, Tex.

Filed Nov. 15, 1988, Ser. No. 271,729

Int. Cl.[5] A01G *31/00*

U.S. Cl. 47—59 **10 Claims**



1. A plant growth bed for growing plants comprising a substantially close-ended bag formed of a relatively thin plastic material impervious to passage of liquids and air therethrough, and a relatively high loft bedding of crimped textile fibers in said bag, the major portion of said crimped textile fibers being hydrophobic synthetic staple fibers, the remaining minor portion of said crimped fibers being hydrophilic staple fibers for enhancing liquid retention, said hydrophobic and hydrophilic fibers being blended together through the bedding and being unconnected to each other so as to permit readily forming a hole in the bedding for reception of a transplanted plant, said relatively high loft bedding of crimped textile fibers providing open spaces around the crimped fibers to allow for optimum air for proper root development and plant growth, said bedding of textile fibers substantially filling the bag to thereby substantially prevent the bedding from undesirably shifting about with the bag, said high loft bedding when not compressed having an overall thickness of at least about 3 inches and density of 0.5 to 2 pounds per cubic foot, and said bedding being readily compressible, as for compact shipment, to bout 1/5 the thickness of the uncompressed high loft bedding and to readily return to a high loft state upon the release of a compressive force thereon.

4,918,862

METHOD FOR GRINDING TROCHOIDAL AND CIRCULAR BEARING RACES

Michel A. Pierrat, 2355 24th St., Boulder, Colo. 80304

Continuation-in-part of Ser. No. 176,846, Apr. 4, 1988. This application Apr. 20, 1989, Ser. No. 340,917

Int. Cl.[5] B24B *5/00*

U.S. Cl. 51—105 EC **4 Claims**

1. The method of forming a trochoidal surface on a blank for use in a speed change device comprising the steps of

providing a first rotary table,

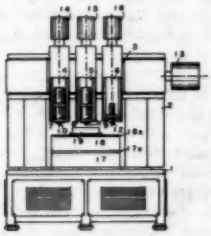
mounting a second rotary table on said first table so that it is free to rotate relative to said first table,

displacing the axis of rotation of said second table from said the axis of rotation of said first table by a predetermined distance,

securing said blank to said second table,

driving said second rotary table in a direction opposite from said first table,

providing a grinding wheel, and



rotating said grinding wheel while in contact with said blank and during the rotation of both of said tables.

4,918,863

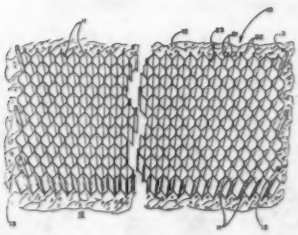
METHOD AND APPARATUS FOR PLANTING SEEDS AND GROWING PLANTS

Nabil N. Youssef, 2168 N. 1450 East, North Logan, Utah 84321

Continuation of Ser. No. 450,783, Dec. 17, 1982. This application Dec. 29, 1988, Ser. No. 291,550

Int. Cl.[5] A01G *9/02*

U.S. Cl. 47—85 **6 Claims**



1. A method of planting seeds and growing plants, comprising the following steps in the following order:

providing a group of adjoining enclosures secured together, each comprising joined, upstanding, continuous wall members having no apertures therethrough, both the top and the bottom of each enclosure being entirely open between said wall members;

placing the group of enclosures upon the soil of a growing plot, the lowermost ends of the enclosures being in contact with said soil;

filling each enclosure at least partially with a plant germinating soil mix;

planting at least one seed in the germinating soil mix of at least selected ones of the group of enclosures; and

allowing the seeds to germinate and the roots of the resulting plants to grow generally downward into the soil, and the plants to grow to harvestable maturity.

4,918,864

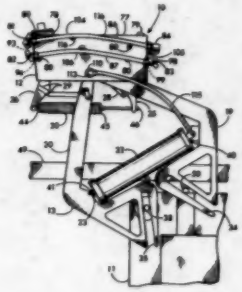
VARIABLE SPEED DOOR OPERATOR

John T. Lanenschloss; Henry M. Ebbott, both of Madison; Raymond A. Beckeman, McFarland, and Glen M. Gregerson, Janesville, all of Wis., assignors to Air-Lec Industries, Inc., Madison, Wis.

Filed Sep. 20, 1988, Ser. No. 246,979

Int. Cl.[5] E05F *15/02*

U.S. Cl. 49—137 **12 Claims**



1. A variable speed controller for selectively varying a moving speed of a door which is moved between first and second positions by an automatic door operator having a control system and a cylinder with a reciprocating piston therein which is positioned identically with respect to the cylinder when the door is in both the first and second positions, comprising:

(a) A first passageway;

(b) A second passageway;

(c) At least one door position responsive valve means operably connected to the control system, cylinder and said passageways for directing fluid from the control system through the first passageway to the cylinder to initiate movement of the door toward the second position when the door is in proximity to its first position and the control system is discharging the fluid; and for directing fluid from the control system through the second passageway to the cylinder to initiate movement of the door toward the first position when the door is in proximity to its second position and the control system is discharging the fluid; and

(d) variable check valve means in the second passageway for permitting unrestricted fluid flow from the cylinder to be exhausted when fluid is exhausted from the cylinder through the second passageway, and for permitting selectively variable restriction of fluid flow from the control system to the cylinder through the second passageway so that movement of the door from the second position to the first position may be initiated at a selected speed.

4,918,865

WINDOW OPENER

Shoichi Hirai, Nishinomiya, Japan, assignor to Nippon Cable System Inc., Takarazuka, Japan

Continuation of Ser. No. 151,669, Feb. 2, 1988. This application Jun. 8, 1989, Ser. No. 364,503

Claims priority, application Japan, Feb. 7, 1987, 62-26926

Int. Cl.[5] E05F *11/04*

U.S. Cl. 49—347 **8 Claims**

1. A window opener for open-and-close operation of a window having a window frame and a wing member rotatably connected to said window frame, comprising:

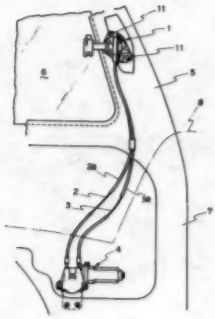
a pulley;

a rotary shaft engaged with said pulley for co-rotation;

a first pull cable wound on said pulley in a first direction so

that a pull-operation of said first pull cable causes a rotation of said rotary shaft in a certain direction;

a second pull cable wound on said pulley in a direction opposite to said first direction so that a pull-operation of said second pull cable causes a reciprocating rotation of said rotary shaft in an opposite direction;



a driving device for alternation of pull-operations of said first pull cable and said second pull cable in opposite directions; and

a link mechanism for converting a rotational torque of said rotary shaft in both directions into an opening-and-closing force for said wing member.

4,918,866

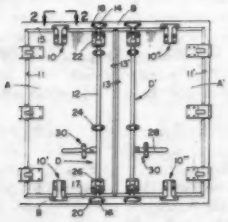
DOOR CONTROL MECHANISM

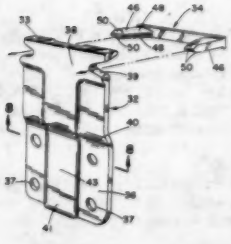
John V. Pastva, Parma Heights, Ohio, assignor to The Eastern Company, Cleveland, Ohio

Filed Aug. 26, 1987, Ser. No. 89,431

Int. Cl.[5] E06B *3/34*

U.S. Cl. 49—381 **9 Claims**





1. In a cargo carrying structure having a rectangular door frame in an upright plane and a door pivoted at one edge to an upright side of the frame, and having an opposite edge spaced from and parallel to the pivoted edge, and further having a latching means for maintaining the door in a closed position adjacent the opposite edge, said frame being subject to racking in use, a follower on said door between the pivoted edge and the latching means, and a cam member on the frame engageable by the follower during and after closing of the door, and prior to latching, said follower comprising a mounting portion secured to a face of the door and opposed follower surfaces stationary relative to the door and extending beyond a top or bottom edge of the door in overlapping relationship with the frame when the door is closed for engaging the cam member, and said cam member having a mounting portion secured to the frame and a wedge extending from the mounting portion outwardly from the plane of the frame a distance sufficient to contact the follower surfaces when the door is partially closed, said wedge having two opposite and converging surfaces each tapering in two directions, one direction being outwardly from the mounting portion and the other direction being transversely of the outward direction, to be received between and cooperate with the opposed follower surfaces as the door is pivoted shut.

4,918,867

OPENING TRIM

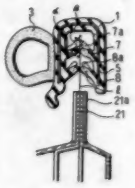
Keizo Hayashi, Nagoya, and Masahiro Nozaki, Aichi, both of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Feb. 21, 1989, Ser. No. 312,946

Claims priority, application Japan, Apr. 14, 1988, 63-050388[U]

Int. Cl.[5] E06B *7/16*

U.S. Cl. 49—490 **3 Claims**



1. An opening trim which is mounted to a body flange of a door mounting opening portion of an automobile, and provided with a U-like cross-section and grasping lips on the inside of the U-like cross-section, comprising:

(a) a portion intended to grasp a thick portion of the body flange and a usual portion continuing to the portion intended to grasp the thick portion;

(b) said portion intended to grasp the thick portion and said usual portion being molded integrally by means of extrusion molding; and

(c) the inclination angle of the grasping lips at least in one side of said portion intended to grasp the thick portion with respect to the flange inserting surface being made smaller than that in said usual portion.

4,918,868

ECCENTRIC GRINDER

Walter Barth, Leinfelden; Karl-Heinz Braunbach, Hornbach, and Manfred Stübler, Leinfelden-Echterdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

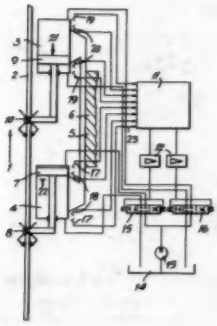
PCT No. PCT/DE87/00540, § 371 Date Jun. 6, 1989, § 102(e) Date Jun. 6, 1989, PCT Pub. No. WO88/04218, PCT Pub. Date Jun. 16, 1988

PCT Filed Nov. 21, 1987, Ser. No. 368,363

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1986, 3642741

Int. Cl.[5] B24B *7/00*

U.S. Cl. 51—120 **16 Claims**



1. Eccentric grinder comprising a housing, comprising an eccentric which is located therein and driven so as to rotate, comprising a grinding plate which is rotatably supported in the eccentric and whose axis of rotation extends at a distance from and parallel to the axis of rotation of the eccentric, comprising a first grinding plate rotating ring with internal drive means and comprising a second grinding plate rotating ring with external drive means which are both rigidly connected at the grinding plate so as to be concentric to the axis of rotation of the latter and are assigned respectively to one of two rolling rings which are concentric relative to the axis of rotation of the eccentric and comprise external and internal rolling means in the housing, and comprising a switching device which is fastened at the housing and has three manually adjustable switching positions for triggering, as desired, a rolling movement of the first grinding plate rotating ring at the first rolling ring or of the second grinding plate rotating ring at the second rolling ring or for stopping a rolling movement of both grinding plate rotating rings, characterized in that the rolling rings (**31, 32**) are supported in the housing (**10**) so as to be rotatable and are in continuous engagement by means of their rolling means (**34, 35**) with the drive means (**28, 29**) of the respective assigned grinding plate rotating ring (**26, 27**), and in that the switching device (**38; 238; 338; 438; 538**) comprises a locking device (**40; 240; 340; 440; 540**) which secures the first rolling ring (**30**) against rotation at the housing (**10**) in the first switching position and secures the second rolling ring (**31**) against rotation at the housing (**10**) in the second switching position and releases both rolling rings (**30, 31**) for free rotational movement in a third switching position.

4,918,869

METHOD FOR LAPPING A WAFER MATERIAL AND AN APPARATUS THEREFOR

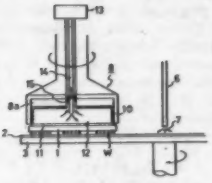
Satoru Kitta, Nagano, Japan, assignor to Fujikoshi Machinery Corporation, Nagano, Japan

Filed Oct. 26, 1988, Ser. No. 262,952

Claims priority, application Japan, Oct. 28, 1987, 62-272658

Int. Cl.[5] B24B *5/00*

U.S. Cl. 51—131.1 **1 Claim**



1. An apparatus for lapping a wafer material which comprises:

(a) a turn table horizontally rotatable around a vertical axis;

(b) a pressing plate, to the lower surface of which at least one wafer material is bonded, and mounted on the turn table to bring the wafer material into contact with the turn table;

(c) a top ring in the form of a downwardly opening cup, the opening thereof being covered by spreading a membrane of an elastic material fluid-tightly sealed to the periphery of the cup, rotatable around a vertical axis and mounted on the pressing plate to be in contact therewith by the mambrane of an elastic material;

(d) a means to supply a pressurized fluid to the space on the inner surface of the membrane of an elastic material; and

(e) a means to regulate the pressure of the pressurized fluid.

4,918,870

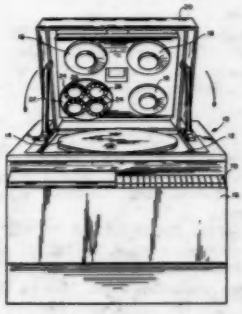
FLOATING SUBCARRIERS FOR WAFER POLISHING APPARATUS

Walter Torbert, Newark; Kenneth C. Struven, San Carlos; Robert E. Loreazini, Atherton, and Anthony C. Bonora, Menlo Park, all of Calif., assignors to Siltec Corporation, Menlo Park, Calif.

Filed May 16, 1986, Ser. No. 864,282

Int. Cl.[5] B24B *37/04*

U.S. Cl. 51—131.3 **14 Claims**



1. An assembly for polishing one of two generally parallel opposed surfaces of a thin wafer having height deviations in an area of said one surface, said assembly comprising:

a. a main carrier having a first face;

b. at least one subcarrying means mounted on said first face of said main carrier for independent angular movement

relative to said main carrier, each subcarrying means for carrying a single wafer and having a first side and a second side, said first side having a face area conforming in shape to an area of said opposed wafer surface which is directly opposed to said area of said one wafer surface having said height deviations, to provide support from said subcarrying means through said wafer for said area of said one wafer surface and resist deformation thereof during polishing; and

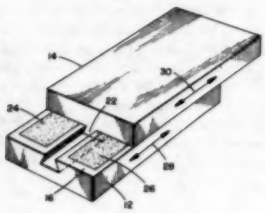
c. means for applying polishing force to a wafer adhered to said subcarrying means through pressure exerted onto said second side thereof while simultaneously allowing said subcarrying means to move angularly relative to said main carrier, whereby said one surface of said wafer is uniformly polished with said area of said one wafer surface supported so that the height deviations therein are substantially eliminated.

4,918,871

RENEWABLE AROMATIC CEDAR BLOCK

James C. Widmann, 8 Putnam Ave., South Norwalk, Conn. 06854

Filed May 4, 1989, Ser. No. 347,343
Int. Cl.[5] B24B *25/00*
U.S. Cl. 51—181 R **4 Claims**



1. A device of cedar wood for providing an aromatic cedar scent comprising:

a first block of cedar wood having a substantially flat surface;

abrasive means secured to the said flat surface and being of a hardness greater than cedar wood;

a second block of cedar wood having a substantially flat surface;

said second block being disposed with its flat surface in contact with the abrasive means;

means to maintain the first and second blocks in slidable contact whereby relative reciprocal sliding will abrade the said flat surface of the second block to renew the scent producing effect thereof.

4,918,872

SURFACE GRINDING APPARATUS

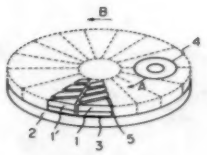
Takesi Sato; Kepichi Mitsuhashi; Yoji Tomita, and Yasuoki Sasaki, all of Ibaraki, Japan, assignors to Kanebo Limited, Tokyo, Japan

Continuation of Ser. No. 16,985, Feb. 19, 1987, abandoned, which is a continuation of Ser. No. 732,207, May 9, 1984, abandoned. This application Jul. 8, 1988, Ser. No. 216,483
Claims priority, application Japan, May 14, 1984, 59-97223
Int. Cl.[5] B24D *5/10*
U.S. Cl. 51—209 R **4 Claims**

1. A surface grinding apparatus having a plurality of grinding wheel segments secured in a predetermined arrangement to a rotary driving platen so that the working surfaces of the segments form a single plane wherein planar surfaces of articles to be ground are brought into sliding contact with said segments at said plane, which comprises:

(a) the arrangement of said grinding wheel segments forming a first plurality of surface grooves extending in a generally radial direction and away from the direction of rotation of said grinding wheel segments to the outer periphery of said arrangement of segments;

(b) at least one second surface groove intersecting and in communication with said first plurality of surface grooves and leading to the outer periphery of said arrangement of grinding wheel segments; and



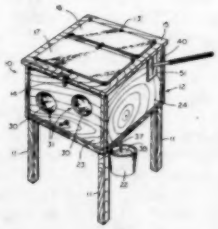
(c) predetermined ones of said grinding wheel segments having a horizontal hole therethrough communicating with a vertical hole open to the working surfaces of said grinding wheel segments, said horizontal holes being in communication with the outer periphery of said arrangement of grinding wheel segments to enhance removal of waste grinding fluid from said working surfaces to said outer periphery of said arrangement of grinding wheel segments.

4,918,873

METHOD AND APPARATUS FOR REFURBISHING GOLF CLUBS

Donald R. Bass, 1341 Overlook Dove, Smyrna, Ga. 30080

Filed Feb. 21, 1989, Ser. No. 313,159
Int. Cl.[5] B24C *1/00, 3/00*
U.S. Cl. 51—281 R **9 Claims**



9. The method of refurbishing a golf club head which comprises the steps of providing a refurbishing chamber, positioning the head of the club within the refurbishing chamber and the grip of the club outside of the chamber, and spraying the club head with an abrasive medium as the club head is manually manipulated by the club grip or that portion of the club

shaft located outside of the chamber wherein a refurbishing chamber is provided of the type that has an open top case formed with a self sealing slot that extends to a slot entry at the upper rim of the base and a repositionable lid, and wherein the head of the club is positioned within the refurbishing chamber by passing the club shaft down through the slot entry and into the self sealing slot from the upper rim with the lid lifted from the base rim.

4,918,874

METHOD OF PREPARING ABRASIVE ARTICLES

Lawrence W. Tiefenbach, Jr., Traverse City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 5, 1988, Ser. No. 229,181
Int. Cl.[5] B24D *3/00*
U.S. Cl. 51—293 **21 Claims**

1. A method of preparing an abrasive greenware article comprising:

(a) admixing abrasive grits and a bond phase comprising silica particles, callodial alumina, a flux selected from the group consisting essentially of metal oxides or precursors thereof and water, to form a slurry,

such that the silica particles are on the average smaller than the average grit particles;

(b) drying the slurry to form a precursor powder;

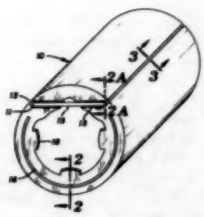
(c) compacting the precursor powder to form an abrasive greenware article.

4,918,875

HAND-HELD SANDING DEVICE

Kenneth J. Klocke, 206 - 20th St., East, West Fargo, N. Dak. 58078

Filed May 19, 1988, Ser. No. 196,017
Int. Cl.[5] B24B *9/10*
U.S. Cl. 51—370 **10 Claims**



1. A hand-held sanding device for use with sandpaper or other abrasive sheet material, which device comprises:

(A) a generally cylindrical tubular body of tough rugged semi-rigid resilient rubber or rubber-like material having an arcuate outer face adapted to engage the back surface of a sheet of sandpaper or other abrasive sheet material over at least a substantial portion of said face,

(B) a relatively narrow flat or shallow concave longitudinal panel along one side of said body, and

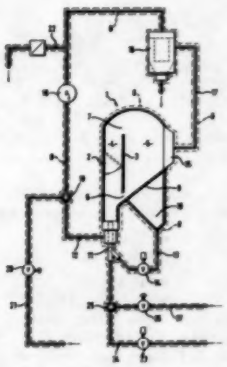
(C) a pair of parallel spaced apart longitudinal slots or channels on opposite sides of the cylindrical body having closely spaced apart side walls for resiliently gripping the opposite parallel edges of a sheet of sandpaper or other abrasive sheet material for securely holding the abrasive sheet material in tight abutting engagement with said body face.

4,918,876

DEVICE TO DEBURR MOLDED PARTS SUBJECT TO LOW-TEMPERATURE BRITTLENESS

Sabine Donath, Oberhausen; Peter Grund, Erkrath; Peter Holz, Linnich; Udo Jakobs, Krefeld, and Wolfgang Volker, Tonisvorst, all of Fed. Rep. of Germany, assignors to Messer Griesheim GmbH, Fed. Rep. of Germany

Filed Mar. 13, 1989, Ser. No. 322,784
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1988, 3810463
Int. Cl.[5] B24C *3/04*; B24B *31/10*
U.S. Cl. 51—426 **7 Claims**



1. In a device for deburring molded parts subject to low-temperature brittleness in which the molded parts are circulated and cooled down by a cryogenic agent and treated with an abrasive, the improvement being in a substantially closed circulation chamber, means for circulating the conveying gas in said circulation chamber to cool down and circulate the molded parts, means for supplying abrasive into said circulation chamber for treating the molded parts said circulation chamber having a lockable filling and removal opening for putting in and taking out the molded parts, said circulation chamber having connections for introducing and removing the conveying gas and a connection for administering the abrasive, a partition dividing said circulation chamber into an acceleration zone with a small flow cross-section and an expansion zone with a wide flow cross-section; an opening for the transition from said acceleration zone into said expansion zone, and an opening linking said expansion zone with the beginning of said acceleration zone.

4,918,877

INFLATABLE TUBULAR STRUCTURE

Walter J. Dutka, 4468 Seneca St., West Seneca, N.Y. 14224

Filed Dec. 8, 1988, Ser. No. 281,076
Int. Cl.[5] E04G *11/04*; E04B *1/345*
U.S. Cl. 52—2 J **4 Claims**

1. A free-standing semi-cylindrical shaped, self-supporting, flexible framework structure, including:

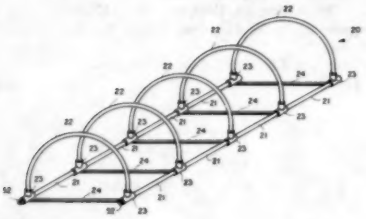
a plurality of hollow connectors having a central passageway and a secondary passageway leading into said central passageway and normal to said central passageway, said plurality of hollow connectors disposed in two horizontal parallel rows;

two parallel horizontal air inflatable tubes having opposite ends disposed through the central passageways of said hollow connectors;

a plurality of secondary tubes having opposite ends, each end of each said secondary tube is disposed in the secondary passageway of one of said hollow connectors on each

said horizontal tube, thereby giving an archer framework between the parallel horizontal tubes;

an air inlet means comprising a ridged plug having a hollow air tube disposed therethrough disposed at one of said ends for each of said horizontal and secondary tubes and



a seal means comprising a ridged plug disposed in the other said end for each of said horizontal and secondary tubes;

a plurality of horizontal stabilizer straps, the ends of said straps attached to opposing connectors on said horizontal tubes.

4,918,878

PAY TELEPHONE ENCLOSURE

Robert A. Paschke, Prior Lake, Minn.; James A. Mosel, Eau Claire, Wis.; Charles H. Kratsch, Maple Grove, Minn.; Dean White, and Travis H. Edinger, both of Chippewa Falls, Wis., assignors to Electric Avenue, Inc., Edina, Minn.

Filed May 27, 1988, Ser. No. 199,484
Int. Cl.[5] E04H *14/00*
U.S. Cl. 52—28 **61 Claims**

1. A pay telephone housing comprising:

a first panel;

a second panel secured at a first angle relative to said first panel;

a back panel secured at a second angle relative to said second panel;

a third panel secured at a third angle relative to said back panel and generally parallel to said first panel;

a fourth panel secured at a fourth angle relative to said third panel and generally parallel to said second panel, at least one of said angles being an obtuse angle; and

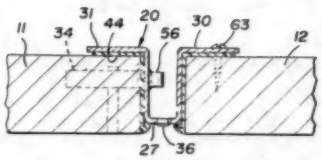
an enclosure portion located between said first and said fourth panel including a planar telephone support member, said telephone support member secured within said enclosure portion generally parallel to said back panel.

4,918,879

MERCHANDISING WALL STRUCTURE INCLUDING READILY ATTACHABLE AND DETACHABLE PANELS AND HAVING PLASTIC REVEALS

Constance C. Bodurow, Canton; Larry D. Murphy, New Philadelphia, both of Ohio, and Gordon R. Perry, New York, N.Y., assignors to Commercial and Architectural Products, Inc., Dover, Ohio

Filed May 29, 1987, Ser. No. 56,141
Int. Cl.[5] E04B *2/82*
U.S. Cl. 52—36 **9 Claims**



1. A modular merchandising wall panel construction including at least first and second vertically oriented structural members having vertical edges, said structural members in edge-to-edge lateral engagement, and means affixing said structural members together and permitting ready disassembly thereof, said means comprising a plurality of recesses provided in an edge of a first one of said structural members and a rotary bolt lock affixed within each recess, and an elongate vertical standard affixed at an edge of the second one of said structural members,

A. each of said rotary bolt locks comprising:

(1) a housing having an opening at an edge thereof,

(2) a hub rotatably mounted in said housing and having an aperture provided therein adapted to receive a driving means,

(3) a radial arm affixed to said hub,

(4) an arcuate bolt extending from an end of said radial arm; and

B. said elongate standard comprising:

(1) a steel channel-form body member including a web having spaced apart parallel edges, a pair of sidewalls one extending from each edge of said web, said sidewalls being oriented substantially parallel to each other and substantially perpendicular to said web, and each sidewall having an edge spaced apart from the associated edge of said web, and

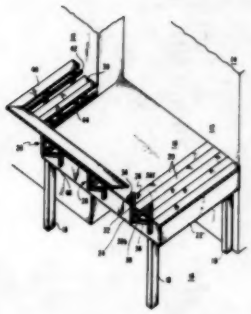
(2) a pair of laterally outwardly extending flanges one extending from said edge of each of said sidewalls, said flanges comprising a mounting flange engaging a face of the second of said structural members and having an aperture provided in said flange and affixing means extending through said aperture and engaged in said second structural member, and a guide flange for engaging the first of said structural members, the sidewall connected to said guide flange being provided with a plurality of pairs of slots, one pair of slots being juxtaposed opposite each of said rotary lock bolts of said first structural member; wherein said two structural members are solidly affixed together edge-to-edge with said elongate standard therebetween, the arcuate bolt of said rotary bolt lock emerging from the aperture of said housing, entering the first slot of one of said pairs of slots in said standard sidewall and returning through the second slot.

4,918,880

DECK SEAT AND SAFETY RAIL COMBINATION

Wayne R. Carney, R.D. 2 Box 177, Stockton, N.J. 08889

Filed Jan. 11, 1989, Ser. No. 295,827
Int. Cl.[5] A47C *11/00*
U.S. Cl. 52—8 **15 Claims**



1. In combination with a horizontal deck arrangement supported above ground level and having a facia member attached to and extending below the deck along the periphery thereof, a seat and safety rail assembly comprising:

a plurality of brackets spaced along said periphery and attached in upstanding relationship to said facia member, each said bracket comprising:

an extended, generally vertical lower post member,

a seat support member substantially perpendicular to said post member, having a front extremity joined to said post member and a back extremity, said seat support member extending from said post member away from and lying substantially entirely outside said facia member;

a back support member joined to said back extremity of said seat support member and extending away from said seat support member in a direction generally opposite said post member;

a top rail support member joined to said back support member remote from said seat support member and having at least a portion thereof extending from said back support member outwardly from said facia member;

a brace extending between said seat support member and said extended post member for maintaining said two last-named members in substantially fixed relationship; and

means adjacent the end of said extended post member remote from said seat support member for fastening said assembly to said facia member.

4,918,881

OBSERVATION DOME FOR BUILDINGS

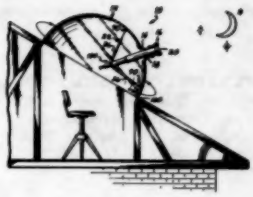
Douglas J. Cottle, 2303 Central Ave., and Andrew C. Helton, 608 Baltimore St., both of Middletown, Ohio 45044

Filed Feb. 3, 1989, Ser. No. 306,774
Int. Cl.[5] E04B *7/16*
U.S. Cl. 52—65 **3 Claims**

1. An observation dome for mounting to a building to form a permanent part of an exterior wall thereof, said dome comprising:

a semi-spherical transparent dome having a circular edge adapted to be sealingly mounted to a surface of a building, said dome having an aperture therethrough for receiving a telescope;

means mounted within said come for supporting and adjustably aiming a telescope positioned for use with said dome, said means comprising a ring sized to receive an end of a telescope, a plurality of screws operably associated with said ring for securing said end of a telescope in said ring, and a plurality of legs associated with said ring for adjustably aiming a telescope secured by said ring, said legs being telescopically adjustable and each said leg being universally adjustably attached at a first end to said ring



and attached at a second end to the inside surface of said dome, and

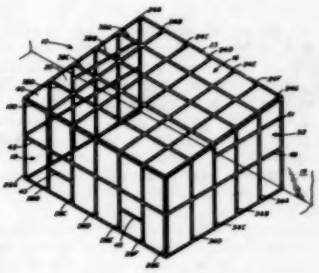
sealing means mounted on said come for providing a weather-proof closure of said aperture.

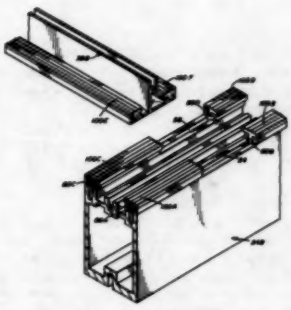
4,918,882

GLAZING RETAINER ASSEMBLY

Murrell N. Funk, Houston, Tex., assignor to Texas Aluminum Industries, Inc., Houston, Tex.

Filed Dec. 21, 1988, Ser. No. 287,725
Int. Cl.[5] E04B *1/32*
U.S. Cl. 52—86 **9 Claims**





1. An assembly for providing support for a glass or other transparent medium comprising:

a beam having a first channel;

a first glazing retainer having a first glazing retainer flange being received in the first channel;

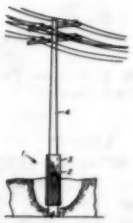
a first glazing strip being attached to and being supported by the first glazing retainer;
a mullion bar being connected to the beam; and
a second glazing strip being attached to the mullion bar, the first and second glazing strips being on the same plane for supporting the glass or other transparent medium.

4,918,883

APPARATUS FOR COMPOSITE POLE REPAIR

Richard A. Owen, and Richard C. Hannay, both of Houston, Tex., assignors to Team, Inc., Alvin, Tex.

Filed Jun. 14, 1988, Ser. No. 206,579
Int. Cl.[5] E02D *27/42*; E04C *5/07*
U.S. Cl. 52—101 33 Claims



1. A composite structural encasement apparatus for bonding to wooden poles for transfer of tensile stresses comprising:
(a) a plurality of woven glass fiber mat strips, arranged with the longer dimension substantially parallel to the longitudinal axis of the pole, wherein the percentage of the woven fibers running along the length of the strops and running parallel to the length of the pole is within the range of from 50% to 80% of the total fibers, and wherein the remaining fibers are arranged so that ½ of the remaining fibers, from 10% to 25%, are placed at a 45° angle to the longitudinal fibers, and the remaining 10% to 25% percent of the woven fibers are placed at an opposite 45° angle to the longitudinal fibers relative to the first set of angled fibers;
(b) a liquid resin for saturation of the woven mat strips which subsequently hardens to form, in combination with the mat strips, a fiberglass encasement repair cylinder for a pole; and,
(c) an ultraviolet resistant coating for application to the exterior of the encasement.

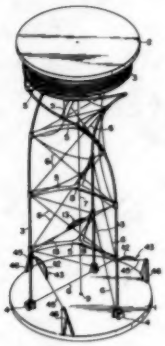
4,918,884

DEPLOYABLE AND COLLAPSIBLE STRUCTURE

Kakuma Okazaki, Yokohama, and Takayuki Kitamura, Yokosuka, both of Japan, assignors to Japan Aircraft Mfg. Co., Ltd., Yokohama, Japan

Filed Nov. 14, 1988, Ser. No. 272,215
Claims priority, application Japan, May 15, 1987, 62-117110; May 15, 1987, 62-71688; May 15, 1987, 62-71689
Int. Cl.[5] E04H *12/18*
U.S. Cl. 52—108 1 Claim

1. A deployable and collapsible structure comprising a pair of end plates; plural longerons arranged parallel to one another and elastically buckled, said longerons being pivoted on the end plates at their both ends; a plurality of radial spacers arranged along the axial direction of the longerons equally spaced from their adjacent ones; paired diagonal cords stretched between two adjacent radial spacers, between the lowest radial spacer and its closest end plate, and between the uppermost radial spacer and its closest end plate; and a pull cord connected to at least one of the end plates, one of the pair of end plates being moved toward the other when the pull cord is pulled, while one of the pair of end plates being separated from the other when the pull cord is loosened, and the longerons being buckled like a coil when the end plates approach each other, while the longerons being deployed like a straight line when the end plates separate from each other; and guide means on one of the pair of end plates for freely slidably glid-



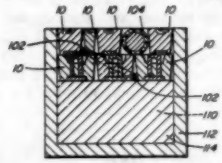
ing, relative to said one of the end plates, one end of one cord of each of the paired diagonal cords stretched between said one of the pair of end plates and the radial spacer closest to it, and said one end of each of the diagonal cords guided by said guide members being connected to the top of the pull cord.

4,918,885

METHOD AND APPARATUS FOR INHIBITING ICE MASS FORMATION

William P. Trumble, Kanata; Alan D. Ross, Gloucester, and Kevin H. Dick, Nepean, all of Canada, assignors to Bell Canada, Montreal, Canada

Filed Oct. 30, 1987, Ser. No. 114,967
Claims priority, application Canada, May 15, 1987, 537312
Int. Cl.[5] E02D *35/00*
U.S. Cl. 52—125.3 19 Claims



1. A method of inhibiting the formation of an ice mass around equipment housed in a chamber subject to water penetration, comprising packing a plurality of compressible, non-absorbent, smooth-surfaced blocks around the equipment to substantially fill the chamber, each block having an upwardly facing handle.

4,918,886

RACEWAY SYSTEM FOR MODULAR WALL PANELS

Fredrick C. Benoit, Corona; Ruben Cardenas, Culver City; Daniel Schmid, Torrance, and Joseph M. Wisniewski, Huntington, all of Calif., assignors to Harpers, Torrance, Calif.

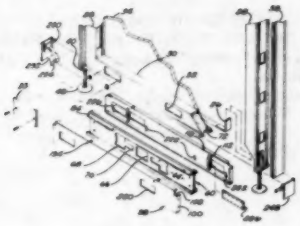
Filed May 31, 1989, Ser. No. 359,287
Int. Cl.[5] E04F *17/00*
U.S. Cl. 52—221 22 Claims

1. In a wall panel of substantially rectangular configuration

comprising a rigid frame having a parallel pair of vertical frame members at the opposite side edges of said panel, a horizontally disposed bottom frame member, and a raceway for electrical power wires connected to the bottom of the bottom frame member, the improvement comprising:

a raceway frame for said raceway secured to and extending along said bottom frame member;

a horizontally elongate substantially rectangular raceway cover of a horizontal length substantially equivalent to the overall width of said panel and of an area to substantially fully enclose a side of said raceway;



detachably engageable means, comprising cooperating portions on a lower horizontal edge of said cover and on a lower portion of said raceway frame, for detachably securing said lower edge of said cover to said raceway frame in a manner to prevent displacement of said cover away from said raceway frame when an upper horizontal edge of said cover is locked to said raceway frame; and

lock means from locking a portion of said upper edge of said cover to said raceway frame in a manner to prevent displacement of said upper edge of said cover away from said raceway frame otherwise then by actuation of said lock means by an auxiliary tool.

4,918,887

PROTECTIVE TENDON TENSIONING ANCHOR ASSEMBLIES

Edgar A. Davis, San Jose, Calif.; Richard L. Watts, Springfield, and John Crigler, Dumfries, both of Va., assignors to VSL Corporation, Los Gatos, Calif.

Filed Oct. 14, 1987, Ser. No. 109,471
Int. Cl.[5] E04C *5/08*
U.S. Cl. 52—223 L **5 Claims**

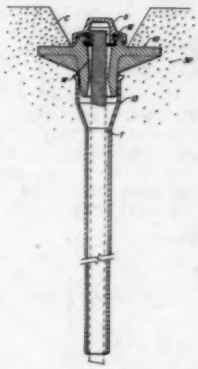
1. A sealed anchor assembly for use in anchoring a post tensioning tendon in a concrete structure, comprising:

an anchor body for mounting in the concrete structure and for connection to the tendon, said anchor body having a bore extending therethrough of a size and shape to allow said tendon to extend through said bore; tendon mounting surface means in said bore for connection to said tendon, surface means on said body extending transverse to said bore, a raised rim on said body surrounding one end of said bore, an annular sealing surface formed on said rim,

a sealing cap for mounting on said body to close and seal said one end of said bore to prevent the ingress through said one end of harmful materials into said bore; said cap having a collar to closely fit over and around said rim, an annular sealing surface on the interior of said cap for cooperation with said sealing surface on said body, finger means on said cap for locking said cap in place on said body closing said one end of said bore, said fingers extending from said cap, surface means on said finger means for engaging said transversely extending surface means on said body to lock said cap on said body,

a resilient annular seal means for mounting on said cap to seal between said cap and said body, said seal means being of a size and shape to engage and be compressed between said sealing surfaces on said body and said cap when said cap is locked in place on said body, and

a tubular trumpet member for mounting on said body at the



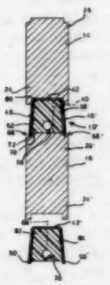
end of said bore, opposite said one end said trumpet member having an opening therethrough of a size and shape to fit around the tendon when said tendon extends into said body.

4,918,888

CHINKING CLOSURE SYSTEM FOR LOG STRUCTURES

Randy K. Giles, and Gordon H. Lucas, both of Jefferson County, Tenn., assignors to Hearthstone Builders, Inc., Dandridge, Tenn.

Filed Feb. 29, 1988, Ser. No. 161,748
Int. Cl.[5] E04B *1/10*
U.S. Cl. 52—233 **8 Claims**



1. An improved chinking closure system for adjacent logs in a log structure comprising:

at least a pair of logs including a first log and second log disposed below said first log, each said log having an elongated body of preselected length along its longitudinal axis and having an upper portion and a lower portion and further defining a width along its traverse axis terminating in first and second exterior surfaces, said logs being arranged such that said lower portion of said first log is juxtaposed and spaced from said upper portion of said second log such that a chink is defined therebetween;

a compressible insulation block member for insertion into said chink so as to engage said upper portion of said second log and said lower portion of said first log whereby said block member supports said first log in a selectively

spaced position above said second log and provides insulation therebetween, said compressible insulating block member being provided with a bore extending longitudinally there through for receiving electrical wiring; and

at least one closure member having an upper portion which is releasably connected to said lower portion of said first log and a lower portion which is releasably connected to said upper portion of said second log.

4,918,889

HIGH-RISE BUILDING

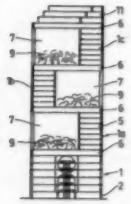
Björn Lundström, Vasavägen 37, S-181 42 Lidingö, and Olle Rex, Attundavägen 6, S-161 52 Bromma, both of Sweden

Filed Aug. 25, 1989, Ser. No. 398,744

Claims priority, application Sweden, Aug. 26, 1988, 8802994

Int. Cl.[5] E04H *1/00*

U.S. Cl. 52—234 **8 Claims**



1. A high-rise building comprising a plurality of storeys, characterized in that two or more units of superimposed storeys of said plurality of storeys are arranged on top of one another; in that each storey unit has a common garden area located within the confines of the high-rise building limiting area with a garden floor area on the same level as the lowermost storey of the unit; in that each storey unit is served by an elevator and staircase arrangement which is restricted to its respective storey unit and accessable from the garden floor area of the lowermost storey of the unit; and in that the garden areas are mutually connected from the ground floors of the lowermost storeys of respective units of the high-rise building by means of separate elevators and staircases.

4,918,890

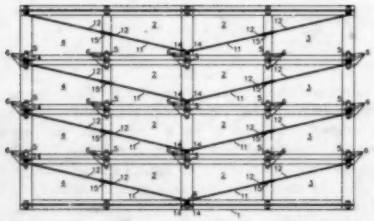
GARAGE DOOR ANTISAG DEVICE

Thomas A. Stafford, 3116 Jordan St., Boise, Id. 83702

Filed Feb. 21, 1989, Ser. No. 313,190

Int. Cl.[5] E04G *23/00*

U.S. Cl. 52—291 **2 Claims**



1. An antisag device for use on garage doors having at least two width defining rectangular panels, one being the right hand panel and the other being the left hand panel, which comprises a pair of adjustable tensive members having off set eyeholes at first and second ends and wherein a first tensive member is tensively and diagonally attached across the right hand panel were said first end of said first tensive member is attached to the upper right hand corner of the right hand panel while said second end is attached to a center point between the lower left hand corner of the right hand panel and the lower right hand corner of the left hand panel and further wherein a second tensive member is tensively and diagonally attached across the left hand panel where said first end of said second tensive member is attached to the upper left hand corner of the left hand panel while said second end is attached to said center point.

4,918,891

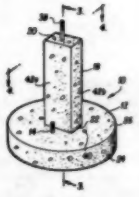
PRECAST CONCRETE FOUNDATION ELEMENTS AND SYSTEM AND METHOD OF USING SAME

Mark Gerszewski, Norfolk, Va., assignor to U.M.C., Inc., Virginia Beach, Va.

Continuation-in-part of Ser. No. 49,060, May 12, 1987, abandoned. This application Apr. 18, 1989, Ser. No. 339,842

Int. Cl.[5] E02D *27/10*

U.S. Cl. 52—295 **14 Claims**



1. A precast one-piece foundation element to be constructed in a factory and transported to a construction site for constructing houses said one piece foundation element comprising:

a concrete, broad, flat-shaped footing having a breadth in all directions of a plane which is greater than twice the thickness thereof, said breadth in said all directions of said plane being around 20 inches or greater, said broad, flat-shaped footing having a broad top side and a broad bottom side;

cast together, as one piece, with said broad, flat-shaped footing on the top side thereof, an elongated concrete pier having a bottom end and a top end and having a substantially greater length dimension than a greatest lateral dimension thereof, said pier extending in elongation perpendicularly away from a central portion of said top side of said footing at the bottom end of said pier, the greatest lateral dimension of said pier being smaller than half the breadth of said footing;

pier reinforcing embedded in and extending substantially throughout said concrete pier into said concrete footing so as to bridge said concrete pier and footing and thereby reinforce a strength with which these two members are bonded one to the other;

footing reinforcing embedded in and cast with said footing, said footing reinforcing extending in said footing laterally beyond said lateral surfaces of said elongated concrete pier;

a bolt, cast with, and thereby embedded in, said pier and extending from the top end thereof, said bolt being sufficiently embedded in said pier so as to allow the foundation element to be lifted and moved about by engaging the bolt only;

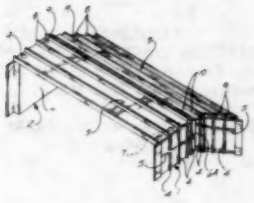
whereby a portion of a house foundation can be formed by boring a round hole in the ground of a depth less than a combined footing thickness and pier length and of a breadth greater than a greatest footing breadth, and then placing said precast foundation element therein with the top end of said pier extending above ground for forming a platform on which said house can be built.

4,918,892

HARDWARE ASSEMBLY FOR MOUNTING COPING

Michio Akasaka, 52 Aka Yamaura, Ooaza Yakushiji Shikatsu-chu, Nishi Kasugai-gun, Japan

Filed May 31, 1989, Ser. No. 359,727
Int. Cl.[5] E04H *12/00*
U.S. Cl. 52—300 5 Claims



1. Assembly for mounting coping on a surface comprising:

a first vertical plate including means for fastening a first end of a cover thereon and means for allowing bending of the plate along a vertical line so as to form an angle defined by the bent plate;

a second vertical plate including means for fastening a second end of a cover thereon and means for allowing bending of the plate along a vertical line so as to form an angle defined by the bent plate; and

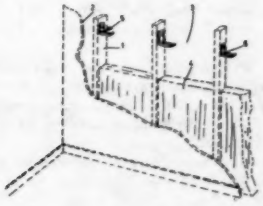
first and second covers to be mounted by their respective ends each to the first and second vertical plates and wherein each cover includes a mating edge for contacting a substantial portion of the mating edge of the other cover when the first and second covers are mounted on the vertical plates and the vertical plates bent to conform to and mounted on a structural body.

4,918,893

ONE-PIECE STUD ATTACHMENT FOR SUPPORTING NON-RIGID INSULATION WITHIN A WALL STRUCTURE

Jack-Eric Vandenbroucke, 33, Lisière, St-Constant, (Quebec), Canada (J0L 1X0), and Jack Vandenbroucke, 1493, Bachand, Carignan, (Quebec), Canada (J3L 4E6)

Filed Oct. 26, 1988, Ser. No. 262,707
Int. Cl.[5] E04B *1/74*
U.S. Cl. 52—404 20 Claims



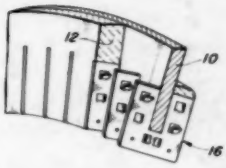
1. A one-piece stud attachment for supporting non-rigid insulation filling cavities within a wall structure including a plurality of spaced apart, generally parallel studs, each of said cavities being delimited by two adjacent ones of said studs, said stud attachment comprising a first and a second tongue portions angularly disposed with respect to each other, said first tongue portion comprising means for attaching the same to one of said studs with the second tongue portion projecting into one of said cavities delimited by the latter stud, which second tongue portion penetrating said non-rigid insulation to support it and thereby prevent slippage thereof downwardly by gravity, wherein at least one of said first and second tongue portions is embossed in order to increase the mechanical rigidity of said stud attachment.

4,918,894

REFRACTORY SUPPORTING ANCHORING SYSTEM

Gary L. Page, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Nov. 21, 1988, Ser. No. 275,045
Int. Cl.[5] E06B *1/58, 1/60*; E04B *1/41*
U.S. Cl. 52—506 7 Claims



1. In an insulated structure comprising a metal member having an interior surface and an open end, said interior surface having an applied thermally insulating refractory liner, and said liner extending to said open end, the improvement wherein:

a plurality of refractory supporting anchors are attached to said open end in a substantially uniformly spaced pattern, said anchors including:

(a) a plate with a slot defined therein for insertion onto, and attachment to, said open end of said metal member; and

(b) at least one refractory supporting element defined longitudinally on each of said plates defining lateral sides of said slot and extending for a distance equal to the thickness of said refractory liner, said refractory supporting elements being substantially surrounded by said applied refractory.

4,918,895

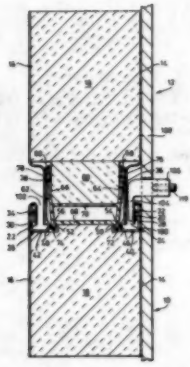
SANDWICH WALL SYSTEM PANEL

Hugo A. Landheer, Spijkenisse, Netherlands, assignor to Hunter Douglas International N.V., Curacao, Netherlands

Filed Jan. 11, 1989, Ser. No. 295,960
Claims priority, application United Kingdom, Jan. 11, 1988, 8800504
Int. Cl.[5] E04C *1/10*
U.S. Cl. 52—580 10 Claims

1. A sandwich wall system panel comprising an insulating core, a first metal skin adhered to one face of the core, a second metal skin adhered to the opposite face of the core, first and second longitudinal edges of each of said first and second metal skins being arranged at opposite longitudinal edges of the panel, a rim portion associated with and extending along the first longitudinal edge of each of said first and second metal skins, said rim portions facing one another, the free ends of said rim portions extending in parallel spaced relation to one another, effective to define a central joining tongue extending from one longitudinal edge of the panel, a pair of spaced parallel legs, one extending along said second longitudinal edge of each of said first and second skins and projecting beyond the core said legs being spaced to form a groove to receive the central joining tongue formed by the rim portions of an adjacent, similar panel, and at least one separate rigid connector,

inserted between and connecting said tongue—forming free ends of said rim portions to said spaced parallel legs to prevent



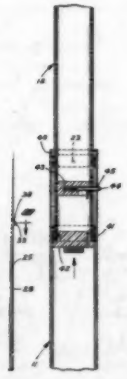
movement of said rim portions towards and away from one another.

4,918,896

TELESCOPIC FLAGPOLE

Harold Wiese, North Highland, P.O. Box 236, Madison, S. Dak. 57042

Filed Oct. 17, 1988, Ser. No. 258,802
Int. Cl.[5] E04H *12/32*
U.S. Cl. 52—632 **9 Claims**



1. A lanyard free telescoping flagpole comprising:

(A) a bottom segment, at least one intermediate segment, and a top segment, each of said segments comprising a rigid elongated cylindrical tube of a size to fit telescopically within the next adjacent lower tube,

(B) guide means to facilitate telescopic movement of adjacent tubes comprising:

(1) bushings adjacent to the upper ends of said bottom and intermediate segments, said bushings being engageable with the outer surfaces of the next adjacent upper tube, and

(2) annular shoulders projecting from the lower ends of said intermediate and top segments, said shoulders being engageable with the inner surfaces of the next adjacent lower tube,

(C) stop means to limit upward extension of adjacent tubes comprising internal bushing rings spaced downwardly from the bushings of the upper ends of the bottom and intermediate segments, said rings being engageable with the outer surfaces of the next adjacent upper tube and with the projecting shoulders of the next adjacent upper tube,

(D) locking means for securing adjacent tubes in extended relation, and

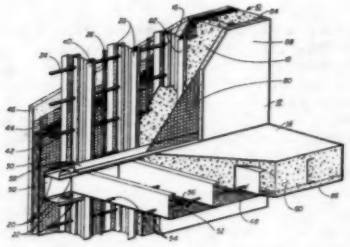
(E) flag-engaging means on said top segment.

4,918,897

CONSTRUCTION SYSTEM FOR DETENTION STRUCTURES AND MULTIPLE STORY BUILDINGS

Charles W. Luedtke, 110 Bransford Rd., NE., Atlanta, Ga. 30342

Filed Oct. 6, 1987, Ser. No. 106,542
Int. Cl.[5] E04B *1/00*
U.S. Cl. 52—747 **7 Claims**



1. A method of constructing a light gauge metal reinforced concrete structure upon a foundation comprising the steps of:

(a) erecting a first level of said structure, said first level including a plurality of light gauge metal framed wall panels having an upper end and a base upon said foundation, by securing said bases to said foundation for forming a framed enclosure;

(b) securing a floor/ceiling member to said upper ends of said wall panels for providing a ceiling over said first level and a floor for a succeeding level;

(c) placing exterior sheathing over said wall panels for enclosing said first level;

(d) loosely fastening a diagonally extending tension strap between said upper end and said base of each of said wall panels;

(e) erecting a second level of said wall panels over said first level wall panels for forming a second story framed enclosure;

(f) tightening said diagonal tension straps of said first level for resisting lateral loads on said wall panels;

(g) erecting successive levels in sequence as detailed in steps a through f for constructing a multi-story structure to a desired height; and

(h) installing a roof assembly over said structure.

4,918,898

BUILDING PANEL

John D. McLeod, Jr., P.O. Box 885007, Leesburg, Fla. 32788-5007

Filed Feb. 7, 1989, Ser. No. 307,036
Int. Cl.[5] E04C *1/10*
U.S. Cl. 52—588 **15 Claims**

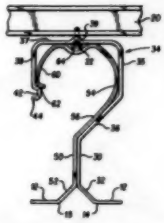
1. A building panel adapted to connect with an adjacent panel of similar structure comprising:

a substantially planar central portion with two opposed edges,

a first riser at one of said edges extending substantially nor-

mal to said central portion and connected to said central portion by a first portion extending outwardly at an angle relative to said central portion, a first channel-shaped locking member connected to said first riser by a second portion extending inwardly relative to said central portion at an angle of 45° relative to said first riser, said first channel-shaped locking member being substantially centered relative to said first riser and defining a longitudinally extending opening at least partly bounded by said second portion,

a second riser at the other said edge extending substantially normal to said central portion and connected to said central portion by a third portion extending outwardly at an angle relative to said central portion, a second channel-shaped locking member connected to said second riser by a fourth portion extending outwardly relative to said central portion at an angle of 45° relative to said second riser, said second channel-shaped locking member being substantially centered relative to said second riser and dimensioned to be snugly received internally of a longitudinally extending opening of a first channel-shaped locking member of an adjacent panel with said second riser and said fourth portion of said panel abutting a first riser and a second portion of said adjacent panel.

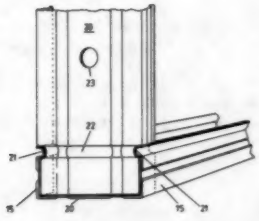


4,918,899

BUILDING FRAME CONSTRUCTION

Alexandros Karytinos, 12 Churcher Street, Thorngate, Australia (5082)

Filed Dec. 14, 1988, Ser. No. 284,208
Claims priority, application Australia, Dec. 16, 1987, PI5935
Int. Cl.[5] E04B 2/58
U.S. Cl. 52—690 **9 Claims**



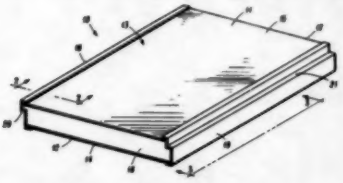
1. Building frame construction comprising upper and lower wall plates and wall studs, each wall plate having a first end and being of a cross-section of a general channel shape that is defined by two side flanges and a web joined to and extending between the plate flanges, each plate flange having an inturned rib adjacent the plate first end, the wall studs joining the upper and lower wall plates, each of said wall studs also having a first end and being of a cross-section of general channel shape defined by two side flanges joined by a web, the flanges of each stud having imperforated deformations defining grooves extending across the full widths of the stud flanges adjacent at least that of said stud first end which inter-engage the inturned ribs of a plate to form an interference fit upon erection and thereby firmly retain that stud end to that plate, said studs and wall plates being of metal roll-formed to said channel shape.

4,918,900

LIGHT-WEIGHT WALL PANEL FOR PROTECTIVE ENCLOSURE

Kevin A. Fee, Marion, and Mark S. Hollinrake, Hiawatha, both of Iowa, assignors to Inter Innovation LeFebure Manufacturing Corp., Cedar Rapids, Iowa

Filed Jun. 30, 1989, Ser. No. 374,303
Int. Cl.[5] E04C 2/00
U.S. Cl. 52—811 **11 Claims**



1. A wall panel for a protective enclosure, the wall panel having oppositely facing major surfaces and a compound wall structure there between, which structure comprises:

an outer wall structure including a plurality of first boards, and a plurality of first metal sheets, said first boards being disposed adjacent one another and said first metal sheets being interleaved between each two adjacent ones of such first boards to from a stack, said stack extending parallel of said major surfaces of said wall panel such that the combined thicknesses of the first boards and interleaved first metal sheets establish the width of said wall panel, adjacent first boards and a respective one of said interleaved first metal sheets being joined to each other by first elongate metal members extending substantially perpendicular through such adjacent first boards and forming a matrix of metal with such interleaving first metal sheets, said matrix permeating said stack of said first boards, said elongate metal members of said matrix extending substantially in parallel to, and said first metal sheets extending in planes perpendicular to, major surfaces of said wall panel;

an inner wall structure disposed adjacent said outer wall structure, said inner wall structure including at least first and second adjacent layers of second boards, said layers being disposed in planes parallel to said major surfaces of said wall panel, and an interleaving second metal sheet disposed between adjacent ones of said at least first and second layers of second boards, said inner wall structure being joined to said outer wall structure by second elongate metal members extending perpendicular to said major surfaces of said wall panel through said layers of interleaved second metal sheet and second boards and into said first boards; and

a metal shell encasing said inner and outer wall structures.

4,918,901

DEVICE FOR THE INFEED OF DISCRETE STRIPS OF TIN FOIL IN CIGARETTE PACKAGING MACHINERY

Antonio Gamberini, and Alessandro Minarelli, both of Bologna, Italy, assignors to G. D. Societa Per Azoni, Italy

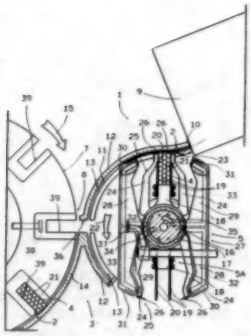
Filed Sep. 16, 1987, Ser. No. 97,445
Claims priority, application Italy, Sep. 24, 1986, 3516 A/86
Int. Cl.[5] B65B 11/30
U.S. Cl. 53—234 **4 Claims**

1. A device for the infeed of discrete strips of tin foil in cigarette packaging machinery, comprising:

indexing means provided with at least one slot designed to accommodate a bundle of cigarettes, and designed to transfer bundles of cigarettes singly and in succession from a point of their entry into said slot, to a folding station, said slot having two transversally opposite flanks on said indexing means, said indexing means includes an indexing head which is rotatable about a given axis, said slot comprising radial side walls immovably mounted to and incorporated into said indexing head and opening radially outwards in relation to said axis;

cigarette feeding means for feeding a bundle of cigarettes to said slot;

supply means downstream from said cigarette feeding means in direction of movement of said indexing means which turn out a succession of discrete strips of tin foil for feeding said foil to said indexing means, said supply means being located adjacent to said indexing means;



a folding station at which, in use, each discrete strip of foil is to be wrapped around a corresponding said bundle of cigarettes;

feed means, and means for moving said feed means as one with said indexing means, for transferring said discrete strips of foil singly and in succession from said supply means to said folding station;

two releasable holding means, integral with said feed means and disposed at respective said flanks of said slot, for taking receipt of each discrete strip of foil from said supply means and holding it to said indexing means on both flanks of the slot so that it bridges over the slot and the respective said bundle of cigarettes accommodated therein during transfer of the slot from said point of entry, to said folding station.

4,918,902

METHOD OF AND APPARATUS FOR FILLING INERT GAS IN A CAN

Tohru Honma, Omiya; Shigeki Mori, Kuki; Kunihiko Ohya, Kasukabe; Shiro Matsumoto, Kasukabe; Akira Nakata, Ageo; Ichiro Abe, Yokohama, and Naoto Hosaka, Kamakura, all of Japan, assignors to Hokkai Can Co., Ltd. and Kirin Brewery Co., Ltd., both of Tokyo, Japan

Filed Jul. 29, 1988, Ser. No. 225,838

Int. Cl.[5] B65B *31/04*

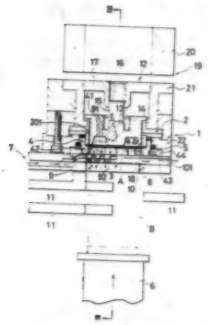
U.S. Cl. 53—403 **20 Claims**

1. An apparatus for filling an inert gas in a cap including a can cap having a panel and a peripheral wall depending from the panel along the entire periphery of the panel and a can barrel filled with contents, said apparatus comprising:

can cap holder means for holding the can cap with the panel up;

a can barrel lifting/lowering device for lifting the can barrel up to a first position in which an upper edge of the can barrel is spaced a gap from a lower edge of the peripheral wall of the can cap held by said can cap holder means, and then for lifting the can barrel up to a second position in which the upper edge of the can barrel is fitted into the peripheral wall of the can cap; and

an inert gas injector having a plurality of injector nozzles along said gap for injecting an inert gas through said gap



into said can cap and said can barrel to replace air in said can cap and said can barrel with the injected gas, when said can barrel is in said first position, said inert gas injector includes an inert gas discharge passage disposed in opposite relation to said injector nozzles for discharging an excessive inert gas injected from said injector nozzles and discharged through said can barrel and said can cap.

4,918,903

PROCESS FOR BOTTLING LIQUID PRODUCTS WHICH WILL CONTAIN FRAGRANCE OILS

Sylvester Holston; Robert Zick, both of Cincinnati, and William Woodruff, Urbana, all of Ohio, assignors to The Drackett Company, Cincinnati, Ohio

Filed Jun. 2, 1989, Ser. No. 360,652

Int. Cl.[5] B65B *3/04;* **B67B** *3/20*

U.S. Cl. 53—471 **16 Claims**

1. A process for bottling a liquid product that will contain fragrance oils which comprises

(a) sequentially filling a bottle having a threaded neck with liquid product and fragrance oils, said fragrance oils being added to said bottle in temporarily bound form whereby the wetting of said bottle neck with fragrance oils is essentially avoided,

(b) applying a threaded cap to said bottle filled according to step (a) so that the threads on said cap engage the threads on said bottle;

(c) applying a torque to said cap to tighten it to a predetermined degree on said bottle, and

(d) subsequent to the filling step (a), allowing said fragrance oil contained in said bottle in said bound form to be released to the liquid product.

4,918,904

METHOD FOR FORMING CLAM-LIKE PACKAGING SYSTEM

Daniel A. Pharo, 1901 Avenue of the Stars, Suite 450, Los Angeles, Calif. 90067

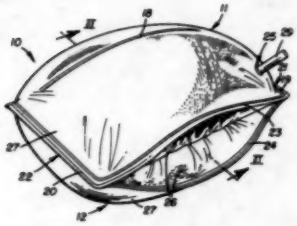
Division of Ser. No. 262,537, Oct. 25, 1988, Pat. No. 4,874,093, which is a continuation-in-part of Ser. No. 89,228, Aug. 25, 1982, Pat. No. 4,872,558. This application Aug. 11, 1989, Ser. No. 392,431

Int. Cl.[5] B65B *23/22*

U.S. Cl. 53—472 **6 Claims**

1. A method for forming a packaging system comprising the steps of

forming a package to define a first bag portion superimposed over a second bag portion thereof with each of said first and second bag portions defining an inflatable chamber therein, including forming at least one seam transversely across said first and second bag portions to define at least



one passage between said first and second bag portions inter-communicating the inflatable chambers thereof,

securing overlying side edge portions of said bag portions together at opposite lateral sides thereof to define an article-retaining pocket therebetween and to expose said pocket on only one side of said package.

4,918,905

METHOD AND DEVICE FOR PACKAGING AN ELONGATE BODY

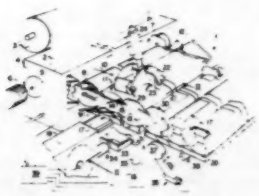
Frans Hoekstra, Diepenveen, Netherlands, assignor to Thomassen & Drijver-Verblifa N.V., Netherlands

Filed Jun. 28, 1988, Ser. No. 212,677

Claims priority, application Netherlands, Jul. 3, 1987, 8701576

Int. Cl.[5] B65B *11/16*

U.S. Cl. 53—411 **18 Claims**



1. Method for packaging an elongate body, for example a stack of covers, comprising the following steps:

the providing of an elongate body for packaging;

the providing of a sheet of packaging material;

the wrapping of said body with said sheet of packaging material such that said sheet protrudes over a predetermined distance beyond at least one outer end of said body;

the folding over of the protruding part from two opposing sides to the relevant end face of said body such that two tapering flaps are formed; characterized by the following step;

the joining of these two flaps substantially to each other only.

4,918,906

METHOD AND APPARATUS FOR PRODUCING A BAG-IN-CARTON

Shigeich Ako, New South Wales, Australia, assignor to Matsushima Engineering Co., Ltd., Nagasaki, Japan

Filed Mar. 18, 1988, Ser. No. 169,943

Claims priority, application Japan, Mar. 20, 1987, 62-64492; Mar. 20, 1987, 62-64493

Int. Cl.[5] B65B *43/14, 43/04*

U.S. Cl. 53—449 **22 Claims**

2. A method for producing a bag-in-carton, comprising the steps of:

(a) providing a flat carton blank having folding lines;

(b) providing a first conveyor means;

(c) feeding said flat carton blank to said first conveyor means;

(d) folding said blank along the folding lines thereof on said first conveyor means to form a square tubular-shaped carton which has side panels and a bottom portion and lies on one side on said first conveyor means which supports and conveys said carton horizontally;

(e) raising said square tubular-shaped carton lying on the side panel thereof vertically and transferring it to a second conveyor means while turning the carton so that the carton runs on said second conveyor means with the side panels thereof parallel to said further conveyor means;

(f) bonding the bottom portion of said square tubular shaped carton while it is being conveyed;

(g) providing a flattened bag having a filling aperture;

(h) feeding the flattened bag to said second conveyor means with a top portion thereof being unsealed;

(i) inserting said bag into the square tubular shaped carton, after inflating said bag to a square-tubular shape from above said square tubular shaped carton conveyed;

(j) measuring and filling product to be packed in a bag-in-carton into said bag; and

(k) successively sealing the filling aperture of said bag and an open portion of said square-tubular shaped carton.

4,918,907

FORMING AND FILLING FLEXIBLE PLASTIC PACKAGING

Kevin V. Roach, Carver; M. Selim Cetiner, Sudbury; Vincent E. Faherty, Brockton, and Francis P. Ventura, Upton, all of Mass., assignors to T W Kutter Inc., Avon, Mass.

Filed Jan. 20, 1988, Ser. No. 146,038

Int. Cl.[5] B65B *5/06*

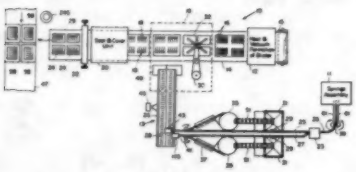
U.S. Cl. 53—453 **41 Claims**

30. In forming and filling flexible plastic packages comprising forming a web of plastic pulled through and processed in a thermoformer to provide formed receptacles, placing articles in said formed receptacles to provide filled receptacles, providing a cover over said filled receptacles, sealing said cover to said web around said receptacles, and cutting said web between said filled receptacles to provide separate packages, the improvement wherein said forming comprises,

advancing a thin flexible web of plastic through said thermoformer,

providing a first pressure difference on opposite sides of said

plastic web when heated and positioned in a mold of said thermoformer to provide an initial contour with substantially uniform stretching of said heated, plastic web, and thereafter providing a second pressure difference which is larger than said first pressure difference and is sufficiently



large to force the heated plastic web into the desired shape of a mold of said thermoformer to provide formed receptacles with a wall thickness at least equal to a predetermined minimum thickness sufficient to maintain integrity of said packages.

4,918,908

APPARATUS FOR FEEDING BLANKS TO A FOLDING TURRET OF A PACKAGING MACHINE

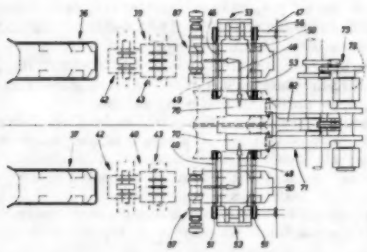
Heinz Focke, and Helmut Granz, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Fed. Rep. of Germany

Filed Nov. 7, 1988, Ser. No. 268,304

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1987, 3738102

Int. Cl.[5] B65B *13/20*

U.S. Cl. 53—579 **13 Claims**



1. Apparatus for feeding blanks to a packaging unit, in the form of a folding turret, with pockets, each receiving a blank, the blanks being conveyable into a position above a pocket of the folding turret and being pressable into the upwardly open pocket as a result of a downward movement, characterized by the following features:

(a) means for pressing the blanks (**10**) in pairs into two respective pockets (**32,33**) of the folding turret (**31**) which are arranged next to one another,

(b) means for simultaneously feeding the blanks (**10**) on separate blank tracks (**39,40**), the distance between these tracks being greater than the distance between the pockets (**32, 33**) of the folding turret (**31**),

(c) means for moving the blanks (**10**), immediately before entering the pockets (**32,33**), towards one another, transversely relative to the blank tracks (**39,40**), to a distance corresponding to the distance between the pockets (**32,33**), in order to be pushed into the pockets (**32,33**) simultaneously.

4,918,909

GREEN ASPARAGUS HARVESTER

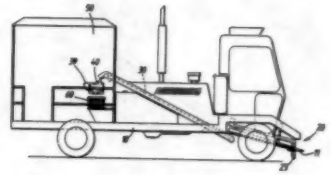
William J. Salkeld, Cowra, Australia, assignor to Linero Pty. Ltd., Cowra, Australia

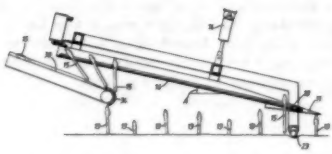
Filed Aug. 30, 1988, Ser. No. 238,572

Claims priority, application Australia, Aug. 31, 1987, PI4077

Int. Cl.[5] A01D *45/00*

U.S. Cl. 56—327.2 **14 Claims**





1. A green asparagus harvester having (i) a spear selection and picking unit and (ii) a harvested spear collection unit, characterized in that the spear selection and picking unit comprises

(a) a comb comprising at least one pair of tynes, the tynes of said pair being spaced from the each other and defining a tapered feed channel for asparagus spears which have a height sufficient to be engaged by adjacent edges of said pair of tynes;

(b) a pair of elongate soft conveyors associated with said pair of tynes, said pair of soft conveyors (i) being mounted adjacent to each other with one end thereof adjacent to the narrow end of the feed channel formed by its associated pair of tynes, and (ii) being spaced apart a distance sufficient to enable the pair of soft conveyors to grip the top of a spear of asparagus without causing damage thereto; the elongate direction of each soft conveyor forming an acute angle relative to the horizontal;

(c) an asparagus spear sensing device associated with and mounted adjacent to said pair of soft conveyors, near to the end thereof which is adjacent to the narrow end of the feed channel formed by its associated pair of tynes, said sensing device being activated by the top of a passing spear of asparagus gripped by its associated pair of soft conveyors; and

(d) an asparagus spear cutting means, adapted to cut a spear of asparagus at or near its base, said cutting means being positioned substantially below said sensing device and being activated when said device is activated; and further characterized in that said spear collection unit comprises

(e) at least one main conveyor having a tail pulley and a shroud partially surrounding said tail pulley, said at least one main conveyor being mounted with its tail pulley adjacent to, but lower than the upper end of said pair of soft conveyors, whereby the bottom end of a cut spear of asparagus being transported by said pair of soft conveyors bears against said shroud and is partially rotated in its associated pair of soft conveyors before being released therefrom, so that the cut spear of asparagus falls on to the main conveyor for transportation tip first by the main conveyor;

(f) a cleated conveyor mounted at the end of said at least one main conveyor, said cleated conveyor being adapted to

transport cut asparagus spears deposited thereon from said at least one main conveyor in a direction substantially at right angles to the direction of conveying of said at least one main conveyor; and

(g) at least one accelerator roller between the discharge end of said at least one main conveyor and said cleated conveyor.

4,918,910

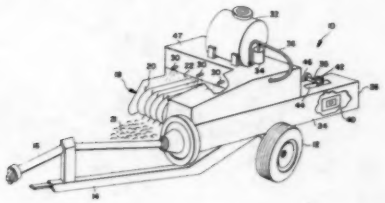
APPARATUS FOR DISPENSING A SUBSTANCE ONTO A CROP MATERIAL AT A CONTROLLED RATE

Ronald T. Sheehan, Lancaster; Shaun A. Seymour, New Holland; Mark K. Chow, Leola, and Richard P. Strosser, Akron, all of Pa., assignors to Ford New Holland, Inc., New Holland, Pa.

Filed Feb. 22, 1989, Ser. No. 313,427

Int. Cl.[5] A01D *39/00*; A01F *15/08*

U.S. Cl. 56—341 **20 Claims**



13. In a baler for picking up crop material and forming it into bales, apparatus for dispensing a substance from a container onto said crop material at a controlled rate, said apparatus comprising:

means for sensing the moisture content of said crop material to develop a first signal;

control circuit means responsive to said first signal for producing a pulse width modulated signal; and,

dispensing means including an electric motor responsive to said pulse width modulated signal for dispensing said substance onto the crop material at a rate determined by said pulse width modulated signal.

14. In a baler for picking up crop material and forming it into round bales, apparatus for dispensing a substance from a container onto said crop material at a controlled rate, said apparatus comprising:

means for sensing the size of a bale being formed in said baler to produce a first signal;

control circuit means responsive to said first signal for determining the rate of bale size increase and from said rate producing a control signal representing the bulk rate of crop flow into said baler; and,

dispensing means responsive to said control signal for dispensing said substance onto the crop material at a rate determined by said control signal.

4,918,911

SPINNING APPARATUS

Gerhard Grau, Muellheim, and Josef Derichs, Moenchengladbach, both of Fed. Rep. of Germany, assignors to Zinser Textilmaschinen GmbH, Fed. Rep. of Germany

Filed Dec. 8, 1988, Ser. No. 281,823

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1987, 3741430

Int. Cl.[5] D01H *7/66*, *7/50*

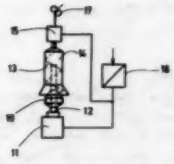
U.S. Cl. 57—100 **17 Claims**

1. In a spinning machine having an electric motor for rotating a bobbin-supporting spindle to build a package of yarn thereon and a funnel for guiding yarn onto the spindle, an apparatus comprising:

an electric motor for rotating the funnel;

means for supplying electrical power;

means, connected to the electrical power supplying means, for controlling the frequency to the electrical power supply;



means for commonly connecting the electric motors to the frequency controlling means, whereby both electrical motors are supplied with electrical power of the same frequency; and

said funnel electric motor having a torque characteristics for rotation of the funnel at a lower rate relative to the contemporaneous rate of rotation of the spindle.

4,918,912

CUT AND ABRASION RESISTANT SPUN YARNS AND FABRICS

Grant H. Warner, Hockessin, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed May 19, 1989, Ser. No. 354,196

Int. Cl.[5] D02G *3/04*, *3/44*; A43B *17/00*; A41B *11/02*

U.S. Cl. 57—255 **8 Claims**

1. A spun yarn comprised of about 40–60 percent para-aramid fiber, about 20–40 percent nylon fiber, and about 10–30 percent acrylic fiber.

2. A spun yarn of claim 1 wherein the percentage of para-aramid fiber is about 50 percent, the percentage of nylon fiber is about 30 percent, and the percentage of acrylic fiber is about 20 percent.

4,918,913

METHOD OF, AND DEVICE FOR, PERFORMING A START SPINNING OPERATION FOR SPINNING OF A YARN IN A FRICTION SPINNING APPARATUS

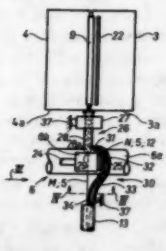
Emil Briner, Winterthur, and Samuel Wehrli, Pfäffikon, both of Switzerland, assignors to Maschinenfabrik Rieter AG, Winterthur, Switzerland

Filed Jun. 6, 1988, Ser. No. 203,061

Claims priority, application Switzerland, Jun. 12, 1987, 02208/87

Int. Cl.[5] D01H *15/02*

U.S. Cl. 57—263 **24 Claims**



1. In a method of performing a start spinning operation entailing starting or recommencing spinning of a yarn in a friction spinning apparatus, wherein freely floating fibers are delivered in a fiber infeed duct to a friction spinning surface of

friction spinning means of the friction spinning apparatus, the fibers are conveyed on the friction spinning surface to a yarn formation location at which there is produced a yarn, and the yarn is withdrawn by yarn draw-off means, the improvement comprising the steps of:

conveying fibers to the yarn formation location;

twisting the fibers at the yarn formation location so as to form a twisted fiber structure of substantially predeterminate size;

generating an air jet for bypassingly conveying the twisted fiber structure and a yarn formed subsequent thereto past the yarn draw-off means;

engaging the twisted fiber structure and the subsequent formed yarn by yarn take-up means disposed after the yarn draw-off means with respect to a predeterminate direction of movement of the yarn;

interrupting the air jet; and

introducing the yarn into the yarn draw-off means.

10. A device for performing a start spinning operation entailing starting or recommencing spinning of a yarn in a friction spinning apparatus, wherein:

said friction spinning apparatus comprises:

first friction spinning means provided with a friction spinning surface;

said first friction spinning means defining a yarn formation location at which there is formed a twisted fiber structure;

means for delivering fibers to the friction spinning surface of the first friction spinning means;

the fibers being formed into the twisted fiber structure at the yarn formation location during the start spinning operation;

a pair of yarn draw-off rolls for withdrawing the twisted fiber structure in the form of a yarn in a yarn withdrawal direction;

at least one roll of said pair of yarn draw-off rolls comprising a non-continuous yarn draw-off roll;

a second friction spinning means arranged in close proximity but in non-contacting relationship with respect to the first friction spinning means;

said first and second friction spinning means forming therebetween a gap of substantially constant but predeterminate width;

said device for performing the start spinning operation comprising:

a blowing duct through which travels an air jet;

said blowing duct having an outlet and a predeterminate blowing direction for the air jet;

the outlet of said blowing duct being directed towards the yarn formation location and the blowing direction being oriented such that thrust of the air jet is divisible into two force components of different magnitudes defining a force component of larger magnitude and a force component of smaller magnitude;

the force component of larger magnitude being effective in the yarn withdrawal direction;

a yarn take-up means disposed after the pair of yarn draw-off rolls viewed in the yarn withdrawal direction; and

a yarn guiding element provided between the first and second friction spinning means and the yarn draw-off rolls for enabling the twisted fiber structure and a portion of the air jet in the blowing duct to bypass the non-continuous yarn draw-off roll such that the twisted fiber structure and a subsequent yarn portion can be engaged by the yarn take-up means.

4,918,914

YARN QUALITY MONITORING METHOD AND APPARATUS

David C. Eaton, Buxton, United Kingdom, assignor to Rieter Scragg Limited, Cheshire, England

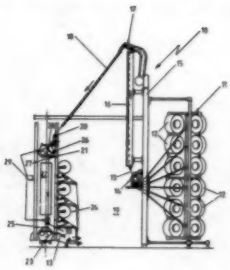
Filed Nov. 20, 1987, Ser. No. 123,242

Claims priority, application United Kingdom, Dec. 11, 1986, 8629597

Int. Cl.[5] **D02G** *1/02;* **D01H** *13/26, 13/32;* **G06F** *15/46*

U.S. Cl. 57—264

20 Claims



1. A method of texturizing a yarn and simultaneously monitoring the quality of a crimped yarn produced during said yarn texturizing process, comprising the steps of:

forwarding a yarn to a crimping device in a texturizing zone and texturizing said yarn in said zone to insert a crimp therein;

measuring a first velocity of the crimped yarn whilst forwarding the crimped yarn through said zone from said crimping device under a first tension which is sufficient to draw out the crimp;

then forwarding the crimped yarn under a stabilizing second tension which is insufficient to draw out the crimp and

measuring a second velocity of the yarn whilst so forwarding it;

and calculating a crimp velocity value from said yarn velocity measurements.

5. An apparatus for texturizing a yarn and simultaneously monitoring the quality of a crimped yarn produced during said texturizing comprising:

a texturizing zone and means disposed in said texturizing zone for crimping a yarn to insert a crimp therein;

first forwarding and tensioning means operable to forward the crimped yarn through said texturizing zone from said crimping means under a first tension sufficient to draw out the crimp therein;

first velocity measuring means operable to measure the velocity of the crimped yarn whilst it is forwarded under said first tension;

second forwarding and tensioning means operable to forward said crimped yarn under a second stabilising tension insufficient to draw out the crimp;

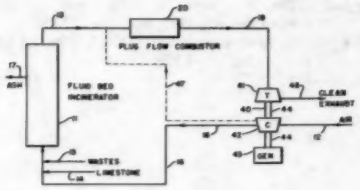
second velocity measuring means operable to measure the velocity of the crimped yarn whilst it is forwarded under said stabilizing second tenson; and

calculating means operable to calculate a crimp velocity value from said yarn velocity measurements.

4,918,915
METHOD FOR CLEAN INCINERTION OF WASTES

William C. Pfefferle, 51 Woodland Dr., Middletown, N.J. 07748

Continuation-in-part of Ser. No. 98,785, Sep. 21, 1987, abandoned. This application Mar. 17, 1988, Ser. No. 169,595
Int. Cl.[5] F02C *3/04*
U.S. Cl. 60—39.02 5 Claims



1. A method for the destruction of hazardous carbonaceous wastes comprising solids, which comprises;

(a) gasifying said carbonaceous wastes and producing an intimate admixture of the gaseous products of said gasification with air, said admixture containing at least a stoichiometric amount of said air;

(b) passing said admixture to a plug flow combustion zone, and

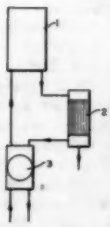
(c) effecting sustained and essentially complete combustion of said admixture under essentially adiabatic conditions in the combustion zone to destroy said gaseous products and to form a heated combustion effluent; said combustion being characterized by said admixture having an adiabatic flame temperature such that the actual flame temperature in the combustion zone is greater than about 1350° K.;

wherein combustion of said admixture is stabilized by mixing of said admixture with hot combustion products prior to passage to said plug flow combustion zone.

4,918,916
METHOD FOR TRANSFERRING WATER FROM COMBUSTION GASES TO AIR OF COMBUSTION

Lars Tiberg, Vad 4201, S-770 20 Söderbärke, Sweden

Filed Aug. 22, 1988, Ser. No. 236,368
Claims priority, application Sweden, Aug. 28, 1987, 87033387
Int. Cl.[5] F01N *3/02*
U.S. Cl. 60—273 3 Claims

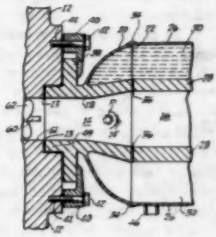


1. A method for transferring water from combustion gases to air-of-combustion when combusting hydrogen containing or moist fuels, comprising cooling the combustion gases to a temperature beneath or in proximity of their dew point temperature, and then further cooling the gases in a regenerative heat exchanger, having a combustion gas side and an air-of-combustion side, with the incoming air-of-combustion, so that water vapor is condensed on the combustion gas side and revaporized on the air-of-combustion side, and transferring both heat and water vapor from the combustion gas side to the air-of-combustion side.

4,918,917
LIQUID COOLED EXHAUST FLANGE

Woodrow E. Woods, 3640 Fiscal Ct., Riviera Beach, Fla. 33404

Filed May 22, 1989, Ser. No. 354,883
Int. Cl.[5] F02B *37/00*
U.S. Cl. 60—320 4 Claims



1. A liquid-cooled exhaust flange for mating a liquid-jacketed exhaust conduit system to a conventional internal combustion engine turbo charger discharge port, comprising:

a generally cylindrical elongated exhaust conduit member adapted to mate in sandwiched relationship between said turbo charger housing and said liquid-jacketed exhaust conduit system;

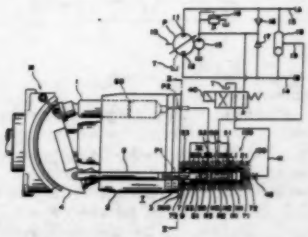
a cooling liquid-jacket housing integrally and concentrically connected to said exhaust conduit member adapted to mate in fluidly communicating relationship with a flow of cooling liquid within said liquid-jacketed exhaust conduit system;

said liquid-jacket housing covering a substantial portion of the external surface area of said exhaust conduit member so as to reduce the temperature of the external surface of said exhaust flange.

4,918,918
VARIABLE DISPLACEMENT PISTON MACHINE

Kenichi Miki, and Yoichiro Kotake, both of Settsu, Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

PCT No. PCT/JP87/00908, § 371 Date Jul. 25, 1988, § 102(e) Date Jul. 25, 1988, PCT Pub. No. WO88/03992, PCT Pub. Date Jun. 2, 1988
PCT Filed Nov. 24, 1987, Ser. No. 251,220
Claims priority, application Japan, Nov. 25, 1986, 61-281567
Int. Cl.[5] F16D *39/00*
U.S. Cl. 60—489 11 Claims



1. A variable displacement piston machine comprising:

a valve plate which is fixed to a housing and provided with

a high-pressure port, a low-pressure port, and a first control port located between both the ports;

a cylinder block which is rotatably mounted and includes a plurality of piston chambers regularly spaced from each other in the circumferential direction and extending in the axial direction, and pistons reciprocating in the respective piston chamber, one end of the cylinder block being in slidable contact with the valve plate so that the piston chambers communicate with the high-pressure port, first control port and low-pressure port as the cylinder block rotates;

a swash plate inclinably mounted to the other end of the cylinder block for adjusting the stroke of the pistons;

a feedback valve for performing a feedback control of the inclining motion of the swash plate, wherein first and second spools engaged with each other are fitted in a valve chamber provided in a main body in such a manner that the first and second spools can move back and forth, the second spool is pressed toward an end of the valve chamber by a spring while the first spool is connected to the swash plate through a connecting member, the second spool is moved against the force of the spring by the pressure of fluid introduced from an introduction passage open to the valve chamber and connects a first control passage communicating with the first control port selectively either to a high-pressure passage communicating with the high-pressure port or to a tank passage while the first spool connects the first control passage selectively either to the tank passage or to high-pressure passage in accordance with an inclining motion of the swash plate and shifts the second spool with the aid of the pressure of fluid introduced into the introduction passage so as to diminish the inclination of the swash plate, and the inclining motion of the swash plate is controlled by shifting the first spool in accordance with the inclination of the swash plate; and

second-spool regulating means provided in the introduction passage for regulating a speed at which the second spool moves.

4,918,919

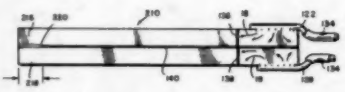
SPLIT MEMORY ELEMENT

William C. McCoy, Zionsville; James E. Small, Logansport, and Gregory Cole, Carmel, all of Ind., assignors to Catheter Research, Inc., Indianapolis, Ind.

Continuation of Ser. No. 246,430, Sep. 19, 1988, abandoned, which is a continuation-in-part of Ser. No. 104,641, Oct. 2, 1987, Pat. No. 4,777,799. This application Jul. 19, 1989, Ser. No. 383,233

Int. Cl.[5] F03G *7/06*

U.S. Cl. 60—528 **34 Claims**



1. A memory element comprising

a tip member, and

first and second strip members aligned in side-by-side relation, each of the tip member, first strip member, and second strip member being made of a shape-memory alloy and having a characteristic internal structure, each strip member including a proximal portion coupled to the tip member, a distal portion, and partition means for interconnecting the proximal and distal portions, each partition means having an internal structure which is dissimilar to the characteristic internal structure of the tip member and the first and second strip members.

4,918,920

HYDRAULIC REMOTE CONTROL DEVICE FOR CONTROLLED MEMBERS, SUCH AS EXTERNAL REAR VIEW MIRRORS ON VEHICLES

Bernard Duroux, Garancieres, France, assignor to Britax (GECO) S.A., Vulaines sur Seine, France

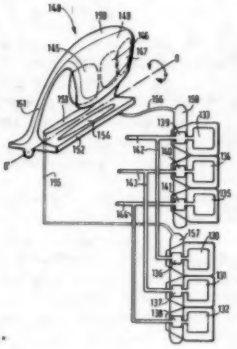
PCT No. PCT/FR87/00371, § 371 Date May 24, 1988, § 102(e) Date May 24, 1988, PCT Pub. No. WO88/02322, PCT Pub. Date Apr. 7, 1988

PCT Filed Sep. 29, 1987, Ser. No. 207,054

Claims priority, application France, Oct. 2, 1986, 86 13776

Int. Cl.[5] F15B *7/02*

U.S. Cl. 60—536 **26 Claims**



1. A hydraulic remote control device for at least one controlled member (211) movable on a support (213, 210), said device comprising:

a manually operated control member and

at least two hydraulic positioning circuits each comprising:

a positioning transmitter (9), which is fluid pressure transmitter comprising a flexible walled deformable bag containing a hydraulic fluid,

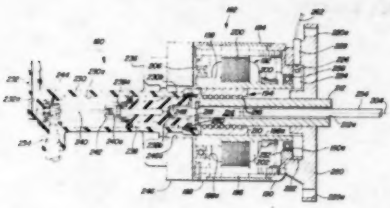
at least one positioning receiver (214), which is a fluid pressure receiver having a variable volume chamber (215), and

at least one line (9a, 216) connecting the transmitter to the receiver, said hydraulic circuits being such that the flexible walled bag (9) of the transmitter of at least one hydraulic circuits mechanically deformed by the manual actuation of the control member, in such manner that fluid contained in it is transferred to at least one of the receivers (214) connected to it, and the receivers (214) mechanically connect the controlled member (211) to its support (213, 210) in order to modify the position of the controlled member relative to the support in response to the operation of the control member, characterized in that the flexible walled bag (9) of each transmitter is mounted directly in the manually operated control member, and in that the manually actuated control member is a direct contact manipulator button comprising a rigid casing (1, 2, 4) delimiting on the one hand an internal space for each of the flexible walled bags (9) and on the other hand at least one opening (8) directly facing at least one portion of the flexible wall of each deformable bag (9), for the purpose of permitting the deformation of each bag (9) by direct pressure applied by the user to its flexible wall.

4,918,921
COAXIAL PUSH ROD AND HOLLOW SCREW BALL NUT DRIVE FOR MASTER CYLINDER

Keith V. Leigh-Monstevens, Troy, and Brian D. Mabee, Warren, both of Mich., assignors to Automotive Products plc, Warwickshire, United Kingdom

Filed Oct. 22, 1987, Ser. No. 111,294
Int. Cl.[5] B60T *13/74*
U.S. Cl. 60—545 **3 Claims**



3. A master cylinder assembly comprising:

(a) an electric motor including a housing and a hollow armature;

(b) a hydraulic master cylinder including a housing rigid with said motor housing, a cylinder defining an elongated bore, a piston movable linearly and slidably in said bore, inlet means in said cylinder for admitting hydraulic fluid into said bore from a reservoir, and an outlet fitting in said cylinder communicating with said bore and operative to convey hydraulic fluid out of said bore for delivery to a slave device in response to linear movement of said piston in said bore;

(c) nut means driven by said armature;

(d) an annular output shaft defining a bore extending axially therethrough and having a threaded portion threadably engaging said nut means so that rotation of said armature upon energization of said motor linearly advances said output shaft;

(e) a first push rod drivingly connected at its outboard end to said piston, having its inboard end disposed within said output shaft bore, and drivingly connected to said output shaft so that said piston is moved linearly in response to linear advancement of said output shaft; and

(f) a second push rod having its inboard end disposed within said output shaft bore in juxtaposition to the inboard end of said first push rod and extending at its outboard end out of the end of said output shaft remote from said master cylinder.

4,918,922
MASTER CYLINDER PISTON WITH INTAKE VALVE AND FLOW/RESISTING ANNULAR RING

Toshihiro Nakano, Chiryu; Shinji Sakata, Nishio; Hitoshi Ichioka, Toyota; Kiyohiko Minagawa, Anjo, and Hideaki Iijima, Hazu, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed May 1, 1989, Ser. No. 345,247
Claims priority, application Japan, Apr. 30, 1988, 63-058907[U]
Int. Cl.[5] B60T *11/20*
U.S. Cl. 60—589 **8 Claims**

1. A master cylinder comprising;

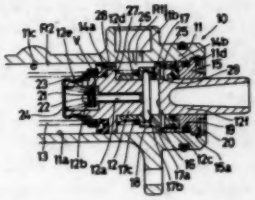
a body having an inner bore;

piston means sealingly mounted in the inner bore for axial movement therein, the body and the piston means defining a supply chamber in fluid communication with a source of fluid and a pressure chamber having an outlet therein;

biasing means for biasing the piston means in one axial direction within the inner bore;

valve means slidably mounted in the piston means for limited axial movement therein between a closed position wherein the valve means is sealingly engaged with the piston means and an open position wherein a gap is maintained between the valve means and the piston means, the valve means including passage means for providing fluid communication between the supply chamber and the pressure chamber when the valve means is in open position;

orifice means in the piston means for limiting flow of the



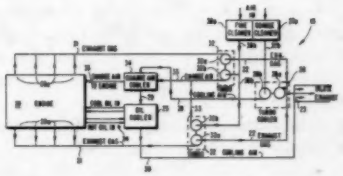
fluid from the pressure chamber to the supply chamber at least during the limited movement of the valve means from the open position to closed position; and

overflow means on the piston means that is responsive to movement of the piston means against the bias of the biasing means for establishing fluid communication between the passage means and the supply chamber only when the valve means is in the closed position.

4,918,923
INTERNAL COMBUSTION ENGINE TURBOSYSTEM AND METHOD

William E. Woollenweber, 3169 Camino del Arco, La Costa, Calif. 92009-7856, and Niels J. Beck, 4073 The Hill Rd., Bonita, Calif. 92109

Continuation-in-part of Ser. No. 159,840, Feb. 24, 1988. This application Jun. 6, 1988, Ser. No. 201,919
Int. Cl.[5] F01P *3/20*; F02G *3/02*
U.S. Cl. 60—597 **11 Claims**



1. An internal combustion engine system with an exhaust-driven, cooling system, comprising:

a multi-cylinder, internal combustion-engine assembly;

means for providing a mixture of fuel and air to the internal combustion engine assembly;

mean for carrying exhaust gas from the internal combustion engine assembly;

means for providing a flow of coolant to and from the internal combustion engine assembly for cooling the internal combustion engine assembly and for carrying heat generated by operation of the internal combustion engine assembly away from the internal combustion engine assembly;

a heat exchanger, connected with said means for providing a flow of coolant, to dissipate the heat carried by said coolant from the internal combustion engine assembly prior to its return to the internal combustion engine assembly;

a turbocooler having a turbine connected with the means for carrying exhaust gas from the internal combustion engine

assembly so that the exhaust gas carried from the internal combustion engine assembly by said exhaust means drives the turbine of the turbocooler, said turbocooler also having a ducted fan means driven by the turbine of the turbocooler, said ducted fan means communicating with atmosphere and generating a ducted flow of cooling air;

means for directing the ducted flow of cooling air generated by the ducted fan means of said turbocooler through the heat exchanger to cool the coolant and dissipate the heat generated in operation of the internal combustion engine assembly; and

means for controlling the cooling air flow generated by said turbocooler ducted fan means, comprising:

means for controlling the volume of exhaust gas driving the turbine of said turbocooler, including:

a turbocooler turbine housing defining a first annular chamber and a second chamber, said chambers having a dividing wall positioned therebetween, said first annular chamber having an exit port directing exhaust gas to the turbocooler turbine, said second chamber having an exit port directing exhaust gas to the turbocooler exit;

a valve port in said dividing wall, said valve port forming a valve seat;

a valve head movable with respect to the valve seat in said dividing wall, said valve head blocking said valve port in one position, thereby directing the exhaust gas from said first annular chamber to act upon the turbine of said turbocooler, and being spaced from said valve seat in another position, thereby diverting the exhaust gas into said second chamber and outwardly from said second chamber through said turbocooler exit, thereby bypassing the turbine of said turbocooler;

means to operate said valve head including a cylinder housing connected with said turbocooler turbine housing at one end, the walls of said cylinder housing forming a cylinder with a wall at the other end forming a bearing opening; a piston formed by a piston rod carried within said bearing opening and a piston head within said cylinder in sealing engagement with walls forming the cylinder, said valve head being carried by said piston rod outside of said cylinder; an energy storing mechanism within said cylinder and acting on said piston rod to urge the valve head in one direction; a further orifice in the cylinder housing walls forming said cylinder to permit the application of fluid pressure to said piston head to overcome the energy of said energy storage device and move the piston head, piston rod and valve head in the other direction; and

means for activating said controlling means, including:

means connecting said cylinder wall orifice with a source of fluid pressure of the internal combustion engine;

a control valve located in said pressure connecting means adapted to control the pressure delivered to said cylinder housing; and

control valve activating means being adapted to operate said control valve in response to engine operating conditions whereby said control valve operates to admit pressure through said pressure connecting means to said cylinder housing to operate said valve head in response to engine operating conditions.

4,918,924

TURBOCHARGING PRESSURE CONTROLLING APPARATUS

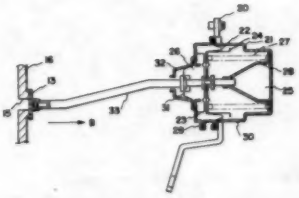
Michio Kyoya, Sagamihara, and Katsuhiko Fukuzumi, Sanda, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha and Mitsubishi Jukogyo Kabushiki Kaisha, both of Tokyo, Japan

Filed Oct. 6, 1988, Ser. No. 254,025

Claims priority, application Japan, Oct. 7, 1987, 62-153875[U]

Int. Cl.[5] F02B *37/12*

U.S. Cl. 60—602 **1 Claim**



1. A turbocharging pressure controlling apparatus, comprising: a control valve (13) for regulating the pressure of air supplied to an internal combustion engine, and an air actuator comprising

a case (21) having a fixed position relative to the internal combustion engine;

a first diaphragm (22) disposed in said case and dividing the interior thereof into an atmospheric chamber (25) and a positive pressure chamber (26);

a second diaphragm (31) disposed in said case for sealing a side of said positive pressure chamber opposite said atmospheric chamber;

a rod (33) having a proximal end extending through said first and second diaphragms and outwardly of said case, and a distal end coupled to said control valve for actuating said valve by extension and retraction motions thereof;

a compression spring (27) disposed in said atomspheric chamber for urging said first diaphragm toward said positive chamber when no positive pressure is supplied to said positive pressure chamber;

a positive pressure supply nipple (29) for supplying positive pressure to said positive pressure chamber; and

an aperture (30) in said case establishing continuous open communication between said atmospheric chamber and the surrounding atmosphere,

wherein a retraction of said rod against the force of the spring resulting from the application of a positive pressure to said supply nipple opens the control valve to attendantly reduce the pressure of air supplied to the internal combustion engine.

4,918,925

LAMINAR FLOW FUEL DISTRIBUTION SYSTEM

Walter J. Tingle, Danvers, Mass., assignor to General Electric Company, Lynn, Mass.

Continuation-in-part of Ser. No. 102,976, Sep. 30, 1987, abandoned. This application Oct. 5, 1988, Ser. No. 253,525

Int. Cl.[5] F02C *7/22*

U.S. Cl. 60—739 **22 Claims**

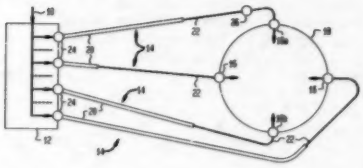
1. A fuel distribution system for a gas turbine engine, said system comprising, in combination:

a distributor for receiving pressurized fuel;

a plurality of fuel injectors;

a corresponding plurality of fuel lines, each said fuel line

connecting a different one of said fuel injectors in parallel fluid communicating relation with said distributor; and



means incorporated in each said fuel line for establishing laminar flow of fuel therethrough from light-off to maximum power of said engine.

4,918,926

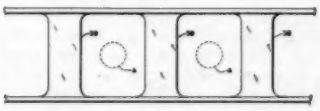
PREDFIFFUSER FOR A GAS TURBINE ENGINE

John P. Nikkanen, West Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 20, 1982, Ser. No. 380,459

Int. Cl.[5] F02C *1/00*

U.S. Cl. 60—751 **2 Claims**



1. For a gas turbine engine having an engine case and a centerline, an axial flow compressor and an annular burner mounted in said engine case about the engine's centerline, an annular prediffuser interposed between said compressor and said burner and axially spaced therefrom, a shell surrounding and radially spaced from said burner defining a dump diffuser, said prediffuser having a pair of radially spaced annular shaped walls defining an annular passage for leading the air discharging from the compressor to said dump diffuser and then to said burner, a first portion of said spaced annular shaped walls being concentric relative to each other so as to define a vane section, vanes mounted between said spaced annular walls in said vane section for removing the swirl component from the swirling air discharging from said compressor, a second portion of said spaced annular walls diverging radially inwardly and outwardly relative to each other for defining a diffuser section, circumferentially spaced struts extending between said annular walls for defining therewith open ended passageways and each passageway having an axial centerline, a plurality of circumferentially spaced fuel nozzles in said annular burner, each having a centerline, the centerline of said each of said fuel nozzles being in coincidence with the centerline of each of said open ended passageways so that the number of said struts equals the number of said fuel nozzles and that the area of the discharge end of said annular diffuser is relatively the same relative to what it would be without the inclusion of said struts by extending the spaced annular walls radially to compensate for the area that would be taken up by said struts that would otherwise block the flow passing through the discharge end of the diffuser had the struts not been there.

4,918,927

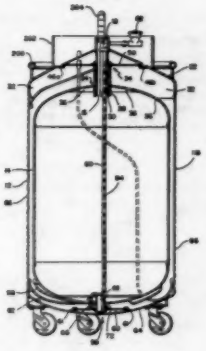
CRYOGENIC LIQUID CONTAINER

Lester K. Eigenbrod, Indianapolis, Ind., assignor to Harsco Corporation, Wormleysburg, Pa.

Filed Sep. 6, 1989, Ser. No. 403,374

Int. Cl.[5] F17C *1/00*

U.S. Cl. 62—45.1 **15 Claims**



1. A container for storing liquefied gas comprising:

an inner vessel having an upper head, a lower head and a sidewall extending between said upper and lower head, said upper head having an opening therethrough;

an outer shell having an upper head, a lower head and a sidewall extending between said upper and lower head, said upper head of said outer shell having an opening therethrough;

a necktube extending between said opening in said upper head of said outer shell and said opening in said upper head of said inner vessel, said necktube connected to said opening in said outer shell; and

an upper lateral support structure comprising a collar disposed to surround said necktube at a portion of said necktube near said inner vessel, said collar being spaced apart from said necktube at a predetermined distance along its length and joined to said upper head of said inner vessel and support means for limiting an amount of lateral movement of said collar and said necktube, said support means extending substantially across a space between said collar and an interior surface of said outer shell, said support means being spaced apart from said collar and from said interior surface of said outer shell at a predetermined distance therefrom.

4,918,928

APPARATUS FOR TESTING IC DEVICES AT LOW TEMPERATURE AND COOLING BAG FOR USE IN TESTING IC DEVICES AT LOW TEMPERATURE

Osamu Morioka, Kakogawa; Keizo Tokushige, Matsubara; Akeo Kimura, Iruma, and Takahiro Nihei, Fukushima, all of Japan, assignors to Kabushiki Kaisha Kobe Seikosho, Kobe and Japan LSI Co., Ltd., Tokyo, both of, Japan

Filed Dec. 15, 1988, Ser. No. 284,547

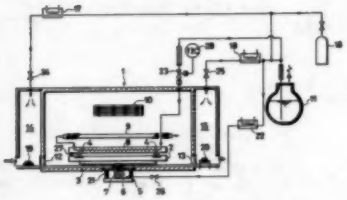
Claims priority, application Japan, Dec. 17, 1987, 62-319761; Dec. 17, 1987, 62-191985[U]; Dec. 17, 1987, 62-191986[U]; May 30, 1988, 63-72270[U]

Int. Cl.[5] F25B *19/00*

U.S. Cl. 62—51.1 **8 Claims**

6. An apparatus for testing IC devices at a low temperature characterized in that the apparatus comprises a test chamber for accommodating therein the IC device to be tested for performance, a blow nozzle for forcing a refrigerant into the test chamber from outside, a tray for receiving the refrigerant

as forced out from the blow nozzle in the form of a liquid, gas circulation means for circulating the refrigerant in the form of a gas within the test chamber through a path over the tray to



cool the interior of the test chamber, and a cooling disk to be cooled by the gas circulation means for cooling the IC device in contact or proximity therewith.

4,918,929

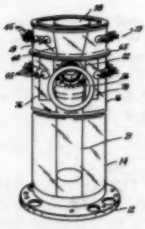
MULTI-DETECTOR DEWAR

John S. Chudy, Long Beach; M. John Kniffin, and D. Yvonne McNeil, both of Santa Ana, all of Calif., assignors to Ford Aerospace Corporation, Newport Beach, Calif.

Division of Ser. No. 68,300, Jul. 1, 1987, which is a continuation of Ser. No. 1,063, Jan. 7, 1987, abandoned. This application May 31, 1988, Ser. No. 200,224

Int. Cl.[5] F25B *19/00*

U.S. Cl. 62—51.1 **2 Claims**



1. A dewar assembly comprising:

a metallic mounting base defining a reference plane;

a glass coldfinger substantially in the form of a hollow cylinder, the rim of one end of said coldfinger being fused to said mounting base, said coldfinger including a detector support affixed to the other end of said cylinder; and

a glass envelope including a plurality of separate sections, one of said sections being a base section having a rim on each end, said rim on one end of said base section being fused to said mounting base, and said detector support protruding beyond the rim at the other end of said base section when said base section and coldfinger are fused to said mounting base.

4,918,930

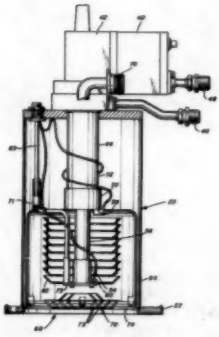
ELECTRONICALLY CONTROLLED CRYOPUMP

Peter W. Gaudet, Chelmsford; Donald A. Olsen, Millis; Michael J. Eacobacci, Randolph; John T. Harvell, Sudbury; Robert J. Lepofsky, Wellesley, all of Mass.; David E. Roche, Nashua, N.H., and Steven A. Bender, Liverpool, N.Y., assignors to Helix Technology Corporation, Waltham, Mass.

Filed Sep. 13, 1988, Ser. No. 243,707

Int. Cl.[5] B01D *8/00*

U.S. Cl. 62—55.5 **43 Claims**



1. A cryopump comprising, as an integral assembly:

a cryogenic refrigerator;

a gas condensing cryopanel cooled by the refrigerator;

a temperature sensor coupled to the cryopanel;

an electrically actuated valve adapted to pass gases from the cryopanel; and

a programmable electronic processor coupled to the sensor to provide a temperature indication, coupled to the valve to control opening and closing of the valve, and coupled to the refrigerator to drive the refrigerator.

4,918,931

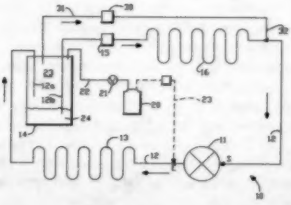
COMPRESSOR SLUGGING PREVENTION METHOD FOR A REFRIGERATION SYSTEM

Albert R. Lowes, Roseville, Calif., assignor to Mydax Corporation, Auburn, Calif.

Filed Sep. 5, 1989, Ser. No. 402,501

Int. Cl.[5] F25B *43/04*

U.S. Cl. 62—83 **23 Claims**



8. An electrical refrigeration compressor system for preventing refrigerant front slugging the compressor, comprising:

a compressor having an inlet and an outlet, the inlet and outlet connected by a closed main loop;

an injection means for injecting an immiscible charging gas into the compressor system to raise pressure by a predetermined amount;

a receiver for separating the injected charging gas and the

refrigerant flowing in the main loop of the operating compressor system; and

a branch in the main loop for conducting the collected charging gas from the receiver into the compressor, the branch having control means for allowing passage of the charging gas into the branch and into the compressor when the compressor system is turned off, the presence of the charging gas in the compressor pressurizing the compressor and preventing slugging of the compressor by the refrigerant in the compressor system.

4,918,932

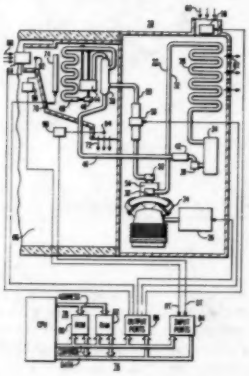
METHOD OF CONTROLLING THE CAPACITY OF A TRANSPORT REFRIGERATION SYSTEM

Alan D. Gustafson, Eden Prairie; Lowell B. Naley, Minnetonka; David A. Christiansen, Bloomington; Stanley O. Holum, Eagan; Robert L. Harrington, Eden Prairie; Dannis R. Johnson, Savage, and Gregory R. Truckenbrod, Fridley, all of Minn., assignors to Thermo King Corporation, Minneapolis, Minn.

Filed May 24, 1989, Ser. No. 356,146

Int. Cl.[5] F25B *1/00*

U.S. Cl. 62—89 **6 Claims**



1. A method of controlling a refrigeration system having a compressor driven by a prime mover, a condenser, a condenser fan, an evaporator, and an evaporator fan, to control the temperature of a served space to a selected set point temperature, wherein the evaporator fan draws return air from the served space and discharges conditioned air back into the served space, comprising the steps of:

sensing the temperature of the return air,

sensing the temperature of the discharge air,

determining the average of the sensed return air and discharge air temperatures,

determining the difference between the average air temperature and the selected set point temperature to provide an average error.

and using the average error to control the capacity of the refrigeration system,

said step of using the average error to control the capacity of the refrigeration system including the steps of:

determining a proportional error as a function of the average error,

determining an integral error as a function of the integral of the average error,

determining a lower limit error as a function of the integral of the difference between the discharge air temperature and the selected set point temperature, plus a predetermined floor temperature,

calculating an error signal by summing the proportional error, integral error and floor error,

comparing the error signal with predetermined parameters, and controlling the capacity of the refrigeration system in response to the comparing step.

4,918,933

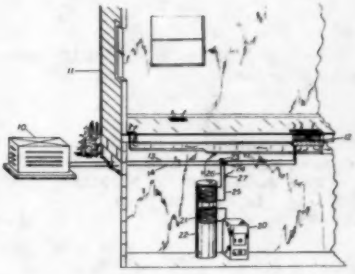
ADD-ON REFRIGERANT BOILER FOR ELECTRIC HEAT PUMP

David F. Dyer, P.O. Box 2255, Auburn, Ala. 36831

Filed Nov. 14, 1988, Ser. No. 270,772

Int. Cl.[5] F25B *7/00*

U.S. Cl. 62—79 **4 Claims**



3. A method of supplying desired quantities of heat to the refrigerant of an electric heat pump, comprising the steps of

a. positioning an electric heat pump to operate in its heating cycle, with the compressor adjusted to function as desired,

b. positioning a boiler near the heat pump,

c. connecting and adjusting at least one controllable valve to each heat pump pipe line that carries refrigerant to its heating or condensing coils and away from said coils,

d. installing refrigerant heat pipe coils in the boiler and connecting same to the two controllable valves, forming a loop for conveying the refrigerant,

e. installing a pump in the refrigerant pipe line that connects the controllable valve, installed in the heat pump refrigerant line that carries refrigerant away from its heating or condensing coils, to the refrigerant heat pipe coils located in the boiler, said pump positioned to circulate the refrigerant from the heat pump pipe line through said refrigerant heat pipe coils in the boiler, thus picking up heat produced by the boiler burn, and back up through the loop and the other controllable valve into the heat pump pipe line that carries said hot refrigerant into the heat pump heating or condensing coils, where said heat is released.

4,918,934

METHOD FOR COOLING ROOMS

Georg Mayer, Innsbrucker Str. 37, 1 Berlin 62; Friedrich H. Schmidt, Kaule 34, 5060 Bergisch Gladbach 1, and Friedrich H. Schmidt, Kaule 34, 5060 Bergisch Gladbach 1, all of Fed. Rep. of Germany

Filed Sep. 21, 1988, Ser. No. 247,283

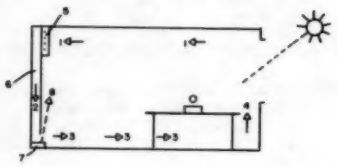
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1987, 3731800; Sep. 29, 1987, 3732792; Oct. 5, 1987, 3733671

Int. Cl.[5] F25D *17/04*

U.S. Cl. 62—89 **3 Claims**

1. A method for dissipating thermal loads of a room using an extremely low air flow rate comprising, providing a drop shaft in a room allowing warm air to contact said drop shaft which has cooling surfaces in its upper part to cool and move air warm air entering the drop shaft at its upper end is cooled and is moved downwards by gravity to leave the drop shaft at its

lower end, deflecting air leaving the drop shaft at its lower end into a hollow floor and passing said air from the hollow floor



through predetermined openings, under or next to the thermal loads located in the room.

4,918,935

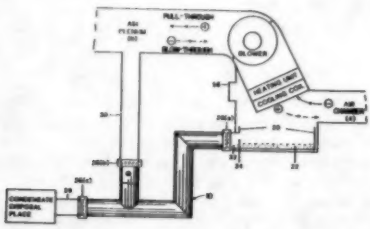
FLUIDIC FLOW CONTROL

Warren C. Trent, 1410 Woodlands Dr., Tyler, Tex. 75703

Filed Mar. 13, 1989, Ser. No. 322,517

Int. Cl.[5] F25D *17/06*

U.S. Cl. 62—93 **22 Claims**



1. A method of removing liquid from an air chamber comprising the steps of: providing a liquid removal conduit communicating with the air chamber and with a source of gas; delivering air into said liquid removal conduit between said air chamber and said source of gas; and controlling the flow rate of air into said liquid removal conduit to permit flow of liquid through the conduit toward the source of gas while preventing flow of gas through the conduit toward the air chamber.

4,918,936

REFRIGERATING CYCLE UTILIZING COLD ACCUMULATION MATERIAL

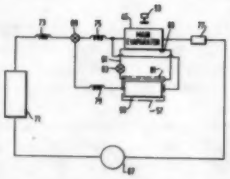
Noriaki Sakamoto, Ibaraki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 153,713, Feb. 8, 1988, abandoned. This application Apr. 13, 1989, Ser. No. 338,342

Claims priority, application Japan, Feb. 27, 1987, 62-045762

Int. Cl.[5] F25B *41/00*

U.S. Cl. 62—117 **21 Claims**



1. A refrigerating cycle comprising:

a cold accumulation material;

a main evaporator for generating cold air for cooling a refrigerator compartment;

a cold-accumulation evaporator for cooling the cold-accumulation material, an outlet thereof being connected to an input of the main evaporator;

a refrigerant supplying means for supplying refrigerant; and

a flowpath switching means for supplying refrigerant from the supplying means via a first refrigerant flowpath to the main evaporator only and via a second refrigerant flowpath to the cold-accumulation evaporator and the main evaporator respectively.

4,918,937

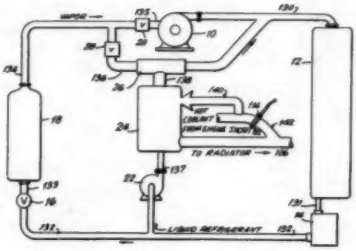
HYBRID THERMAL POWERED AND ENGINE POWERED AUTOMOBILE AIR CONDITIONING SYSTEM

Solomon S. Fineblum, 112 Shady La., Randolph, N.J. 07869

Filed May 30, 1989, Ser. No. 358,648

Int. Cl.[5] F25B *1/06*

U.S. Cl. 62—175 **11 Claims**



1. In a hybrid air conditioning system for a motor vehicle comprising a mechanical compressor driven by the engine of said motor vehicle and, in a refrigerant circuit parallel, therewith, a thermal compression means, said mechanical compressor and said thermal compression means in a circuit including an evaporator, a suction valve a condenser, a reservoir, an expansion pressure reduction means upstream of said evaporator, a refrigerant pump, a vapor generating heat exchanger and a means for conducting coolant from the coolant jacket of said engine into and through said vapor generating heat exchanger in thermal contact with liquid refrigerant, various temperature and pressure detection means, and a control circuit, that improvement comprising:

A check-valve in fluid flow series with said thermal compression means;

An electrical ON-OFF switch which turns on said mechanical compressor as soon as the air conditioner is turned on when said engine is running;

A timer switch for turning on said refrigerant pump after a period of said mechanical compressor operation sufficient to assure that said mechanical compressor has been effective in achieving the initial cool-down of the passenger compartment;

A coolant by-pass valve in engine coolant line from said coolant jacket of said engine to the radiator of said motor vehicle;

A pressure switch at the outlet of said thermal compression means adapted to sense a minimum pressure of refrigerant vapor as required for condensation, said pressure switch actuating controls to unload said mechanical compressor by turning off said mechanical compressor when said thermal compression means is capable of driving refrigeration system as indicated by the high pressure at the outlet of said thermal compressor;

Whereby, initially, the refrigerant vapor is pulled out of said evaporator, compressed and forced into said condenser by the action of said mechanical compressor which is powered by said engine, said refrigerant vapor condensing into liquid within said condenser, from whence it flows into and through said reservoir and thence through said expansion, pressure-reduction means which is immediately upstream of said evaporator which is in heat transfer contact with air in said passenger compartment, wherein the refrigerant in said evaporator is endothermally evaporated such that heat is absorbed from said passenger compartment through the evaporator into said evaporating vapor and such that the vapor is pulled from said evaporator through said suction valve into the suction inlet of said mechanical compressor until sufficient time has elapsed for the coolant in said engine coolant jacket to get hot enough to boil said refrigerant in said vapor generating heat exchanger, the time being measured by said timer which acts to close off said coolant by-pass valve, thus forcing coolant to flow through said vapor generating heat exchanger, and some cool-down has been achieved in said passenger compartment, additional time being measured by another said timer which acts to energize said refrigerant pump which draws some of the liquid refrigerant from the fluid conduit downstream of said reservoir and drives said liquid into said vapor generating heat exchanger wherein the hot engine coolant transfers sufficient heat to boil the high pressure liquid refrigerant such that the resulting high pressure vapor flows from said vapor generating heat exchanger into the primary inlet of said thermal compression means, wherein the vapor is greatly accelerated and wherein sufficient suction is created to draw refrigerant vapor from said evaporator and wherein the vapor is compressed and from whence the compressed vapor is driven into said condenser wherein the vapor is exothermally condensed and from whence the liquid refrigerant flows into and through said reservoir and into a liquid refrigerant conduit which directs some refrigerant into said refrigerant pump and some refrigerant into said expansion, pressure-reducing means which releases low pressure liquid refrigerant for inlet into said evaporator wherein the refrigerant endothermally absorbs heat from the evaporator and from which the refrigerant flows into the secondary inlet of said thermal compression means in the refrigerant branch which flows from the evaporator outlet tube at a point between said evaporator and said suction valve, into said branch which contains the thermal compression means and check valve in series, to continue the refrigeration cycle which is driven by said thermal compression means which receives its energy from the waste heat in the hot engine coolant and thereby conserving the energy which is usually used to drive said conventional mechanical compressor which is taken from said engine, thus improving the fuel consumption of such vehicles so equipped.

4,918,938

HEAT EXCHANGER

Lockwood De Forest, Mosman; Ian D. Roberts, Nunawading, and Christoper W. S. Dixon, Brighton, all of Australia, assignors to Siddons Industries Limited, Victoria, Australia

Continuation-in-part of Ser. No. 819, Jan. 6, 1987, abandoned. This application Apr. 8, 1988, Ser. No. 179,450

Claims priority, application Australia, Jan. 8, 1986, PH4142

Int. Cl.[5] F25B *27/00*

U.S. Cl. 62—238.6 **20 Claims**

1. A water heater comprising:

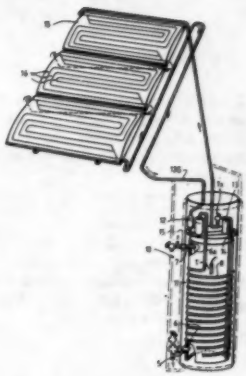
a generally cylindrical water tank having a wall formed from material having heat transfer properties;

a cold water inlet adjacent one end of the tank;

a hot water outlet adjacent the other end of the tank;

a tube comprising iron adapted to carry a refrigerant fluid and helically wound externally about said tank wall with the helical windings being axially spaced one from the other;

heat-conductive bonding material substantially coextensive with the length of said tube disposed solely directly between said tube and said tank wall for securing said tube and said tank wall substantially continously one to the other, leaving the tank wall between the helical windings of said tube free of bonding material, said tube and heat-conductive bonding material being in heat-conductive relation with said tank wall through its external surface to transfer heat from condensation of refrigerant fluid in said tube through said wall to the water contained in the tank, said tube about said tank being under tension to reduce the



likelihood of the heat-conductive bonding material breaking during expansion and contraction of the tube and tank during use;

said tube extending from a position adjacent said one end of the tank to a position not exceeding about 75% of the length of said wall of said tank;

an evaporator positioned to be exposed to ambient conditions for absorbing heat energy from said ambient conditions and having a passage for carrying the refrigerant fluid whereby such fluid may be heated by said ambient conditions; and

a compressor connected to said passage and to said tube to circulate refrigerant fluid through said tube and to said evaporator.

4,918,939

SELF-CONTAINED AIR DRYING UNIT

Vincent P. Fresch, Elm Grove; Titus Mathews, Kenosha, and Anthony R. Rossi, Brookfield, all of Wis., assignors to Pneumatech, Inc., Kenosha, Wis.

Filed Jan. 10, 1989, Ser. No. 295,482

Int. Cl.[5] F25D *21/00*

U.S. Cl. 62—272 **3 Claims**

1. An improved self-contained air drying unit of the type in which heated air from a compressor is introduced into the unit and cooled and dried in a heat exchanging evaporator which has been supplied with liquid refrigerant, wherein the improvement comprises:

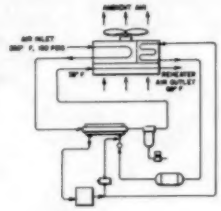
aftercooler means disposed within the unit for reducing the temperature of the air prior to its introduction into the heat exchanging evaporator,

condenser means disposed within the unit and substantially adjacent said aftercooler means for cooling the compressed refrigerant gas and producing liquid refrigerant,

air circulating means disposed within the unit for generating an air current within the unit such that ambient air is

drawn across both of said aftercooler means and said condenser means, and

reheating means for raising the temperature of the air exiting the heat exchanging evaporator with said reheating means disposed within the unit and substantially adjacent and



upstream of said aftercooler means and said condenser means so that said air circulating means first draws ambient air across said reheating means so that the ambient air is cooled prior to being drawn across said aftercooler and condenser means.

4,918,940

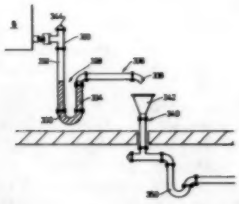
AIR CONDITIONING APPARATUS

Christopher M. Buckley, Newcastle under Lyme, England, assignor to Scientific Glass (Drainline) Limited, Great Britain

Filed Mar. 24, 1989, Ser. No. 328,336

Int. Cl.[5] F25D *21/14*

U.S. Cl. 62—285 **6 Claims**



1. Air conditioning apparatus including ducting defining a flow passage from an air inlet to an air output and operatively connected to the interior of a structure to be air conditioned, air processing means within the ducting for treatment of the air passing therethrough, air impeller means for inducing a flow of air through the ducting in use, and drain means for removing surplus moisture derived from operation of the apparatus; characterised in that said drain means comprises a first pipework section leading directly from a collector in which said surplus moisture is operatively deposited and including a U-shaped trap having a downleg leading from the collector and an upleg, a fluid seal being operatively maintained in said trap to prevent air flow along said fist section; a second pipework section leading laterally from an upper end portion of said upleg to a delivery spout; and a third pipework section including an open topped tundish positioned in use to receive fluid flow from the delivery spout while providing an air gap between the second and third pipework sections to prevent siphonic voiding of the fluid seal in the trap in use, said third section delivering the surplus moisture to an outflow in use; all said pipework sections being formed of circular section clear glass tubular components having high resistance to corrosion and accumulation of deposits and low coefficient of thermal expansion connected by readily releasable couplings incorporating compression seals of flexible material which will not readily support microbiological growth, whereby visual inspection of the integrity of the fluid seal and the cleanliness of the drain means in use is facilitated and to provide ease of dismantling for routine cleaning and disinfection.

4,918,941

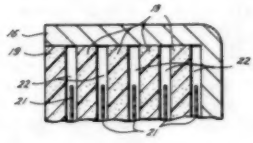
CRYOGENIC ULTRAMICROTOME SEAL

Herbert K. Hagler, Dallas, Tex., assignor to Board of Regents, The University of Texas System, Austin, Tex.

Filed May 16, 1989, Ser. No. 353,804

Int. Cl.[5] F25C *5/02*

U.S. Cl. 62—320 **15 Claims**



1. A thermal seal for use in a cryogenic ultramicrotome having a cryogenic chamber and a microtome arm extending through an aperture in said cryogenic chamber from a reactively high temperature exterior of said chamber to a relatively low temperature interior of said chamber, said seal comprising:

a seal container attached to said cryogenic chamber;

a plurality of thermally insulating baffle inserts within said container together forming a plurality of baffle chambers, each baffle insert having an aperture therein substantially aligned with said aperture of said cryogenic chamber and being larger than an exterior dimension of a cross-section of said microtome arm; and

a plurality of thermally insulating baffle membranes, each membrane being located and moveable within a respective one of said baffle chambers, each membrane having an aperture substantially aligned with said aperture of said cryogenic chamber and being dimensioned for slidable engagement with said exterior dimension of said microtome arm.

4,918,942

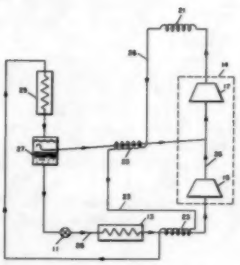
REFRIGERATION SYSTEM WITH DUAL EVAPORATORS AND SUCTION LINE HEATING

Heinz Jaster, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 11, 1989, Ser. No. 419,982

Int. Cl.[5] F25B *7/00*

U.S. Cl. 62—335 **5 Claims**



1. A refrigeration system using a two phase refrigerant for use in a refrigerator having a freezer compartment and a fresh food compartment, said refrigeration system comprising:

a refrigerant flow control means;

a first evaporator for providing cooling to the freezer compartment;

a two stage compressor;

a condenser;

a capillary tube;

a second evaporator for providing cooling to the fresh food compartment;

conduit means for connecting all the above elements together in series in the order listed, in a refrigerant flow relationship; and

a phase separator having an inlet and two outlets, the first outlet for providing liquid phase refrigerant, the second outlet for providing gaseous phase refrigerant, said phase separator having its inlet connected to said second evaporator and its first outlet connected to the refrigerant flow control means by said conduit means, the second outlet of said phase separator connected between the first and second stages of said compressor, a first fraction of said capillary tube in a heat transfer relationship with the conduit means connecting said phase separator second outlet between the first and second stages of said compressor, a second fraction of said capillary tube in a heat transfer relationship with the conduit means connecting said first evaporator with the suction side of said first stage compressor.

4,918,943

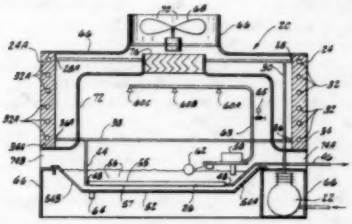
CONDENSER

Paul A. Faust, 26 Grantwood La., St. Louis, Mo. 63123

Filed Jan. 26, 1989, Ser. No. 301,837

Int. Cl.[5] F28D *5/00*

U.S. Cl. 62—305 **29 Claims**



1. A condenser for compressed refrigerant gas or vapor from a compressor comprising

a first heat exchanger for the transfer of heat from compressed refrigerant received from the compressor to ambient air, the first heat exchanger having an inlet for receiving compressed refrigerant, an outlet, and a first conduit connecting said first heat exchanger inlet and outlet and means for transferring heat from the first conduit to ambient air,

a second heat exchanger having two substantially parallel walls each of which has an outer surface with at least one of said walls being heat conductive, an inlet for receiving compressed refrigerant from the first heat exchanger outlet, an outlet for delivering cooled compressed refrigerant to an evaporator, and a second heat exchanger conduit connecting the second heat exchanger inlet and outlet for the flow of compressed refrigerant therethrough, the second heat exchanger conduit being between the two walls and substantially parallel to the outer surfaces of the two walls,

evaporative cooling means for cooling the outer surface of the heat conductive wall of the second heat exchanger as compressed refrigerant flows through the second heat exchanger conduit, and

a partition for preventing mixing of ambient air used for heat exchange with the first heat exchanger and air used for evaporative cooling of the second heat exchanger.

4,918,944

FALLING FILM EVAPORATOR

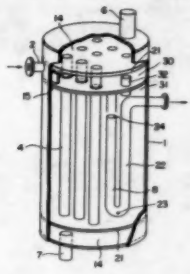
Kenji Takahashi, Abiko; Takuji Torii, Ushiku; Takao Sensbu, Shizuoka; Tetsuji Yamashita, Shizuoka, and Shizuo Zushi, Hadano all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 21, 1988, Ser. No. 260,698

Claims priority, application Japan, Oct. 23, 1987, 62-266389

Int. Cl.[5] F75B *43/02*

U.S. Cl. 62—471 **13 Claims**



1. In a falling film evaporator in which a plurality of heat exchanger tubes are provided in a shell to form an evaporating compartment utilizing a falling film, a liquid-film flow of a liquid refrigerant being formed over outside surfaces of said heat exchanger tubes to effect heat exchange between said liquid refrigerant and fluid flowing in said heat exchanger tubes, the improvement comprising a gas-liquid separating means which is arranged in a space of said evaporating compartment to communicate with a compressor which comprises a part of a refrigeration cycle; said gas-liquid separating means comprising a pipeline in which a lubricating oil in said evaporating compartment is intermingled with a refrigerant to be supplied from an evaporator to said compressor and through which the thus-intermingled fluid is supplied to said compressor and further comprising means for introducing a liquid refrigerant and a lubricating oil collected in a lower portion of the evaporating compartment into a refrigerant discharge pipeline by utilization of a pressure difference between a pressure in the evaporating compartment and a pressure in the refrigerant discharge pipeline, said pipeline serving to cause a gas refrigerant within the evaporating compartment to be discharged.

4,918,945

BINARY SOLUTION COMPRESSIVE HEAT PUMP WITH SOLUTION CIRCUIT

Vinko Mucic, Walldorf, Fed. Rep. of Germany, assignor to TCH Thermo-Consulting-Heidelberg GmbH, Heidelberg, Fed. Rep. of Germany

PCT No. PCT/EP88/00291, § 371 Date Nov. 18, 1988, § 102(e) Date Nov. 18, 1988, PCT Pub. No. WO88/09468, PCT Pub. Date Dec. 1, 1988

PCT Filed Apr. 8, 1988, Ser. No. 283,947

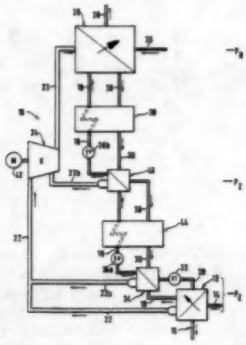
Claims priority, application Fed. Rep. of Germany, May 18, 1987, 3716642

Int. Cl.[5] F25B *1/00*

U.S. Cl. 62—502 **3 Claims**

1. Binary solution compressive heat pump or refrigeration machine (10) with an evaporator (12) and a condenser (20) which are connected together in a solution circuit, in which a binary refrigerant formed from an ammonia-water mixture is circulated, wherein gaseous refrigerant is driven out in the

evaporator (12) at a low pressure level (p_E) with the input of thermal energy at a low temperature level and the poor solution thus produced is pumped with pressure increase by means of a pump in a first pipeline branch (18) to the condenser (20) where the gaseous refrigerant driven out in the evaporator (12) is reabsorbed in the poor solution after its pressure is increased to the condenser pressure (p_R) by means of a compressor (24) with removal of the resorption heat thereby produced at an elevated temperature level, and the rich solution thus formed flows back to the evaporator (12) in a second pipeline branch (30) with its pressure lowered by means of a throttling member (32), and a temperature exchanger (38) is inserted into the sections of the first and second pipeline branches (18; 30) which are at the condenser pressure (p_R), in which heat contained in the rich solution issuing from the condenser (20) is transferred to the poor solution flowing to the condenser and heat contained in the rich solution issuing from the temperature exchanger (28) is used for the further evaporation of the



poor solution fed to the temperature exchanger, the additional evaporator for the further evaporation of the poor solution being disposed on the one hand in the section of the second pipeline branch (30) running between the temperature exchanger (38) and the throttling member (32), characterized in that at least two pumps (36a; 36b) increasing the pressure in the poor solution step-wise to the condenser pressure (p_R) are inserted into the first branch (18) of the solution circuit carrying the poor solution from the evaporator (12) to the condenser (20), and the additional evaporator (40) is disposed on the other hand in the section of the first pipeline branch running between the two pumps (36a; 36b), which is at an intermediate pressure (p_Z) and that the gaseous refrigerant additionally expelled from the poor solution in the additional evaporator (40) at the level of the intermediate pressure (p_Z) is pumped to the condenser (20) by a separate compressor or by being fed into a medium pressure stage of the multistage compressor (24) pumping the gaseous refrigerant from the main evaporator to the condenser.

4,918,946

PROCESS AND DEVICE FOR BENDING GLASS SHEETS

Luc Vanaschen, Eupen, Belgium; Hans W. Kuster, Aachen, Fed. Rep. of Germany, and Herbert Radermacher, Raeren, Belgium, assignors to Saint-Gobain Vitrage, c/o Saint-Gobain Recherche, Aubervilliers, France

Filed Jul. 5, 1989, Ser. No. 375,480

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1988, 3822639

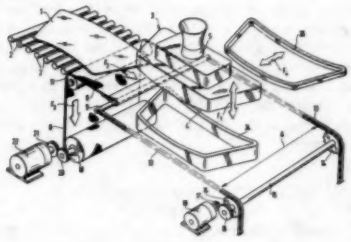
Int. Cl.[5] C03B *23/03*

U.S. Cl. 65—104 **15 Claims**

1. A process for bending glass sheets according to which a glass sheet is loaded flat on the end of a conveyor going through a tunnel furnace, comes out again through the other end of the tunnel furnace after having reached its bending temperature, is conveyed by a first transfer device to a bending unit which comprises at least one upper bending form, is picked up by suction by the at least one upper bending form, which then is raised, and is bent to the desired shape by the bending unit, then is directed by a second transfer device to a cooling station, the transfer from the tunnel furnace to the bending unit being obtained by the reversible movement, parallel to the general direction of movement of the glass sheet, from the front end of a flexible conveyor belt the rear end of which is under the transport plane of the glass sheet, the initial position of the front end of the flexible conveyor belt being located between the downstream end of the conveyor and the bending unit.

4. A device for bending glass sheets, said device comprising:

(a) a horizontal furnace through which a roller conveyor passes;



(b) a bending station placed at the outlet of said horizontal furnace, said bending station comprising at least one vertically mobile upper bending form;

(c) a first device for the transfer of glass sheets between roller conveyor and said bending station; and

(d) a second device for the transfer of bent glass sheets to a cooling station, wherein:

(e) said first device comprises a section of a flexible conveyor belt made of a heat resistant material; and

(f) the front edge of said section is able to be moved in a reversible way between a ready position located between said conveyor and said bending station and an extreme downstream position located on the other side of said bending station.

4,918,947

KNITTING MACHINE FOR PRODUCING WARP KNIT

Francisco Speich, Gipf-Oberfrick, Switzerland, assignor to Textilma AG, Hergiswil, Switzerland

PCT No. PCT/CH87/00116, § 371 Date May 12, 1988, § 102(e) Date May 12, 1988, PCT Pub. No. WO88/02038, PCT Pub. Date Mar. 24, 1988

PCT Filed Sep. 11, 1987, Ser. No. 211,232

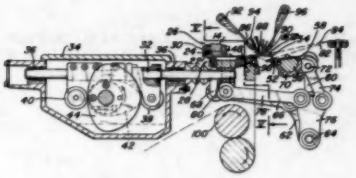
Claims priority, application Switzerland, Sep. 16, 1986, 3702/86

Int. Cl.[5] D04B *23/00*

U.S. Cl. 66—203 **16 Claims**

1. Knitting machine for producing a warp knit fabric including warp threads, the machine including knitting needles (18, 20) guided reciprocatingly to and from an advanced position transverse to a knockover bit, warp thread guides (52, 54, 51_1, 54_1) for the needles, the warp thread guides being movable between the knitting needles for placing the warp threads on the knitting needles when the knitting needles are in the advanced position thereof, and at least one reciprocating filling thread guide (86) transverse to the needles (18, 20), the improvement comprising the knitting needles (18, 20) being uniformly distributed on upper and lower knitting-needle bars (14, 16), the knitting-needle bars lying on the same side of the

goods, and being arranged alternately to one another and capable of being alternately driven, each knitting-needle bar



(14, 16) being assigned a set of warp thread guides (52, 54, 52_1,54_1).

4,918,948

THREAD FEEDER FOR KNITTING MACHINES

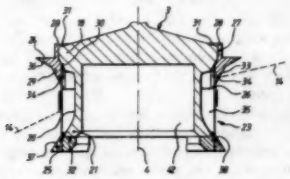
Seigfried Nürk, Albstadt, Fed. Rep. of Germany, assignor to SIPRA Patententwicklungs- u.Beteiligungsgesellschaft mbH, Albstadt, Fed. Rep. of Germany

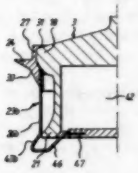
Filed Apr. 5, 1988, Ser. No. 177,780

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1987, 3711558

Int. Cl.[3] D04B *15/48*

U.S. Cl. 66—132 T **17 Claims**





1. Thread feeding device for feeding a thread to a knitting machine, comprising: a carrier means; a rotor mounted on said carrier means for rotation about an axis and having a first and second end section; means coupled to said rotor for rotating the latter about said axis; a thread feeding and storage means fastened to said rotor; a thread entry guide means for guiding the thread when being fed to said feeding and storage means; and a thread guide means for guiding the thread when running out of said feeding and storage means; said feeding and storage means being a premanufactured rod cage at least having a thread lead-in section and a thread storage section for storing at least one turn of said thread, said storage section comprising a plurality of rod-like, rectilinear supporting elements having support surfaces, said supporting elements having first and second ends and being disposed substantially parallel to said axis such that said support surfaces are distributed on a substantially cylindrical surface coaxial with said axis, said lead-in section being a ring, said ring comprising a plurality of holes in each of which one of said first ends of said supporting elements is fixedly secured, and a substantially continuous, conically and inwardly tapering circumferential lead-in surface outside of said substantially cylindrical surface and coaxially disposed with respect to said axis and extending at least up to the supporting elements for leading the thread coming from said entry guide means onto said storage section; and first and second means for easily mounting and dismounting said feeding and storage means as a whole to and from said rotor for cleaning, repairing and replacing the same, said first means easily and removably attaching and centering said ring on said first rotor end section, and said second means at least easily centering said second ends of said supporting elements on said second rotor end section.

4,918,949

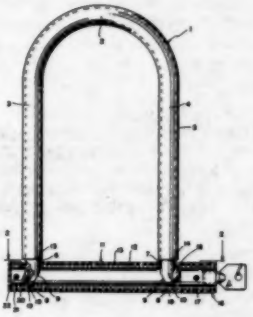
TAMPER-RESISTANT LOCK

Dixon Newbold, Glocester Providence, R.I., assignor to Rhode Gear USA, Providence, R.I.

Filed Mar. 25, 1988, Ser. No. 173,455

Int. Cl.[3] E05B *67/22*

U.S. Cl. 70—38 A **12 Claims**



1. A tamper-resistant lock having a shackle and a housing, said shackle comprising a U-shaped member having spaced apart legs with free ends, said free ends being identically constructed and symmetrically arranged and each having means thereon for engaging and being secured by a lock mechanism in the housing, and said housing having a pair of spaced receiving means for receiving either of said ends, whereby said shackle may be assembled in locked relationship to said housing with either end thereof inserted in either of said receiving means, said lock mechanism being disposed in said housing in association with one of said receiving means for engaging and securing one end of said shackle when said one end is placed in said one receiving means, and means for securing the other end of said shackle in the other said receiving means when said lock mechanism is in engagement.

4,918,950

HIGH SECURITY PADLOCK

William R. Foshee, Noblesville, Ind., assignor to Best Lock Corporation, Indianapolis, Ind.

Division of Ser. No. 55,185, May 28, 1987, Pat. No. 4,836,001, which is a continuation of Ser. No. 718,538, Apr. 1, 1985, abandoned. This application Feb. 21, 1989, Ser. No. 312,685

Int. Cl.[3] E05B *67/22*

U.S. Cl. 70—38A **7 Claims**

1. A lock comprising:

a padlock case having a bottom end wall, the padlock case being formed to include a core-receiving chamber having an opening in the bottom end wall,

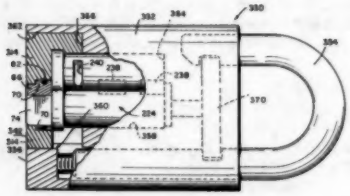
a lock core in the core-receiving chamber,

a padlock cap having a rear face, and

means for mounting the padlock cap on the lock core to protectively block at least a portion of the chamber open-

ing in the bottom end wall of the padlock case, wherein the lock core includes:

a core body of figure-eight cross section having an upper lobe and an integral lower lobe, the upper lobe having an exterior surface, the lower lobe being formed to include a chamber for receiving a key plug, and wherein



the mounting means depends from the rear face of the padlock cap and includes flange means for detachably engaging the padlock cap to an exterior surface of the upper lobe of the core body.

4,918,951

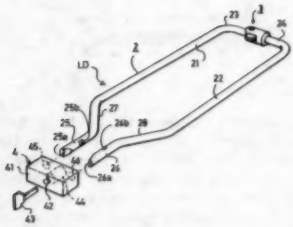
LOCKING DEVICE PARTICULARLY USEFUL FOR LOCKING MOTORCYCLES, BICYCLES AND THE LIKE

Abraham Kavizky, 9 Ilanot Street, Gat Rimon 49920, Israel

Filed Jun. 29, 1989, Ser. No. 373,138

Int. Cl.[5] E05B *67/06*

U.S. Cl. 70—53 **10 Claims**



1. A locking device particularly useful for locking a motorcycle, bicycle or other movable object to be fixed with respect to a fixed object, comprising a shackle for enclosing a part of the movable object and a part of the fixed object; and a lock for locking the shackle when in an enclosing position to attach the movable object to the fixed object when the lock is in its locked position, or for releasing the shackle to permit detachment of the movable object from the fixed object when the lock is in its released condition; characterized in that:

said shackle comprises a pair of rigid bars of strong material disposed in a common plane;

said pair of rigid bars being pivotally mounted to each other at one end so as to be pivotal in said common plane to an open position or a closed position and terminating opposite to the pivotal mounting in a pair of free ends extending parallel to each other;

said locking device comprising a housing enclosing a locking mechanism and formed with a pair of openings for receiving the free ends of the shackle thereby to lock the movable object to the fixed object;

said free ends of the rigid bars being bent inwardly towards each other such as to permit them to be inserted into relatively closely-spaced openings in the lock housing, while the remainders of the bars are relatively widely-spaced to permit them to enclose relatively large parts of the movable object and of the fixed object.

4,918,952

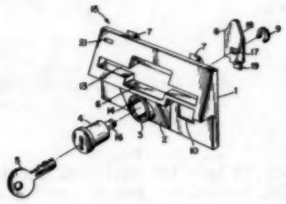
COMPUTER DATA DRIVE LOCKING DEVICE

Robert P. Lakoski, Austin, Tex., and Jody L. Numbers, Tempe, Ariz., assignors to Lama Systems, Inc., Austin, Tex.

Filed Aug. 2, 1988, Ser. No. 227,129

Int. Cl.[5] E05B *65/00*

U.S. Cl. 70—57 **6 Claims**



1. A computer data drive locking device for a computer having a slotted data storage or receiving access member and having a chassis surrounding the member, where the chassis has a front opening, comprising:

(a) a bezel dimensioned to cover the front opening of the chassis and defining a slot,

(b) mounting means for attaching said bezel to the chassis,

(c) a reinforced lock-plug receptacle formed in and extending through said bezel, said receptacle containing an elongated groove,

(d) a key-actuated lock-plug seated in said receptacle and capable of rotation relative to said receptacle, said lock-plug containing an elongated projection corresponding to said groove where said projection and groove restrict the rotation of said lock to a preselected limit and further comprising lug means on said bezel to restrict rotation of said locking bar to the preselected limit,

(e) a locking bar connected to said lock-plug and capable of movement between a slot-blocking position and a slotun-blocking position, said locking bar being located behind said bezel,

(f) where actuating said lock-plug moves said locking bar to the blocking position to block said bezel slot and the slotted access member of the computer to prevent introduction of articles to or removal of articles from the slotted access member.

4,918,953

LOCK MECHANISM

Donald J. Newman, Somerville, Australia, assignor to Ogden Industries Pty. Ltd., Huntingdale, Australia

Filed Jan. 31, 1989, Ser. No. 304,235

Claims priority, application Australia, Feb. 1, 1988, PI 6513

Int. Cl.[5] E05B *63/12*

U.S. Cl. 70—131 **15 Claims**

1. A lock bolt mechanism for mounting to a door or like closure having an inside face and an outside face including:

a housing adapted to be mounted to the inside face of said door,

a lock bolt mounted on said housing for movement relative thereto between locked and unlocked terminal positions,

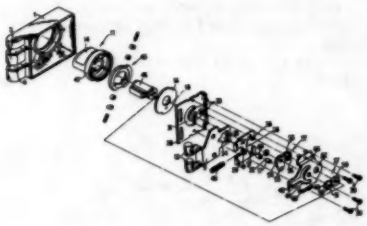
an inside actuator rotatably mounted on said housing,

a first drive connection between said inside actuator and said lock bolt whereby said bolt is caused to move in response to rotation of said inside actuator,

an outside actuator adapted to be accessible from the outside face of said door and adapted to be rotatably mounted on said door or said housing,

a second drive connection between said outside actuator and said lock bolt whereby said bolt is caused to move in response to rotation of said outside actuator,

a gear train forming part of said second drive connection, said gear train including at least one partial gear wheel having a segment which has no gear teeth, and a second



gear wheel for engagement with said partial gear wheel, rotation of said outside actuator causing said partial gear wheel to engage said second gear wheel to move said lock bolt between said terminal positions,

said second gear wheel being disengaged from said partial gear wheel to break said second drive connection when said lock bolt is in either terminal position.

4,918,954

LOCK MECHANISM FOR EQUIPMENT OF DATA PROCESSING TECHNOLOGY

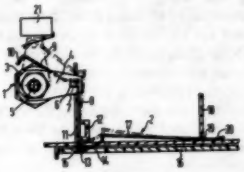
Heinz Stickel, Groebenzell, and Peter Reihl, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 14, 1989, Ser. No. 365,740

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1988, 8807729

Int. Cl.[5] E05B *65/06*

U.S. Cl. 70—134 **20 Claims**



1. A lock mechanism for data processing equipment, comprising:

a rack including movable locking means biased towards a locking position;

a switch mounted on said rack to be actuated into a locked condition or an unlocked condition, including an actuating member;

a key-operated lock mounted on said rack including a lever mounted to pivot about a pivot axis to a locking position and to an unlocking position;

a first actuation element carried by said lever for engaging said actuating member and operating said switch into the unlocked condition when said lever is pivoted to the unlocked position;

a movable part to be locked, said movable part being movable relative said rack towards and away a locking position; and

a second actuation element carried by said lever to engage and move said locking means out of engagement with said movable part when said lever is pivoted to the unlocking position.

4,918,955

VEHICLE KEY DEVICE

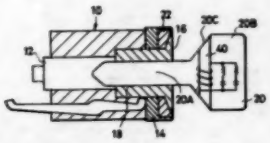
Takashi Kimura, and Mitsuo Mori, both of Aichi, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Oct. 6, 1987, Ser. No. 105,039

Claims priority, application Japan, Oct. 7, 1986, 61-238489

Int. Cl.[5] E05B *47/00*

U.S. Cl. 70—277 **10 Claims**



1. A vehicle lock having a keyhole for inserting a key comprising:

a key;

a wound coil surrounding the keyhole for magnetically coupling the key in response to the inserting of the key in the keyhole;

signal generating means for applying a data detecting signal to the wound coil;

circuit means mounted on the key disposed to magnetically couple the wound coil for generating first predetermined data in the data detecting signal, said first predetermined data being distinctive to the key;

signal detecting means for detecting the generated first predetermined data;

means for storing second predetermined data; and

control means responsive to the first predetermined data and the second predetermined data for selectively generating a permission signal.

4,918,956

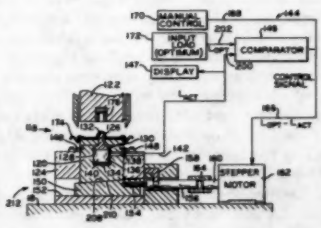
MONITORABLE AND COMPENSATABLE FEEDBACK TOOL AND CONTROL SYSTEM FOR A PRESS USING A SOLID TOOL BACKUP ELEMENT

Daniel A. Schoch, Minster, Ohio, assignor to The Minster Machine Company, Minster, Ohio

Continuation-in-part of Ser. No. 90,215, Aug. 27, 1987. This application Jan. 30, 1989, Ser. No. 304,185

Int. Cl.[5] B21D *37/10*; B21J *9/20, 13/00*

U.S. Cl. 72—21 **8 Claims**



1. A method of monitoring and controlling a back-up load to at least one of an upper and lower tool in a press during the actuation of the tools on a workpiece comprising:

applying a variable back-up force to the one tool wherein the back-up force is effected at least during tool actuation,

sensing the back-up load at said one tool during actuation of the tools on the workpiece and producing a signal correlated to the sensed load;

comparing a predetermined reference load signal and said sensed signal and producing an output control signal as a function of said compared signals; and

controlling, in response to said control signal, the back-up load on said one tool by adjusting the position of a solid, non-fluid back-up element to increase or decrease resistance in a direction opposite to the direction of force applied by the other tool.

4,918,957

LOCK WITH LOCKING FUNCTION RELEASED BY INSERTION OF A CODED CARD

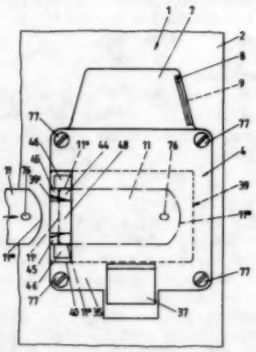
Armin Eisermann, Eichholzstrasse 14, D-5620 Velbert 1, Fed. Rep. of Germany

Filed Jul. 25, 1988, Ser. No. 224,073

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1987, 3724711; Jul. 25, 1987, 3724710

Int. Cl.[5] E05B *47/00*

U.S. Cl. 70—276 **10 Claims**



1. In a lock with a locking function of a bolt which is released by the insertion of a coded, scanned card, and carried out by means of a key, in particular for use in safety deposit box compartments of public swimming pools or the like, the lock having a casing with an outwardly open card insertion shaft, and a slide which is displaceable by the leading edge of the card during insertion, said slide being biased away from the direction of card insertion and having a control finger for lifting a locking pawl associated with the bolt, the improvement comprising:

said card insertion shaft being arranged on a second slide which is displaceable by the locking movement of the bolt, said first slide having a cam and being supported by said second slide, when said second slide is displaced forwardly from its stop position said cam is controlled on the leading edge of the card, whereby said first slide releases the function of the bolt locking repeat barrier.

4,918,958

DEVICE FOR BENDING CONICAL WIRES

Reiner Glomb, and Ralf Fangmeier, both of Solingen, Fed. Rep. of Germany, assignors to Kieserling & Albrecht GmbH & Co., Werkzeugmaschinenfabrik, Fed. Rep. of Germany

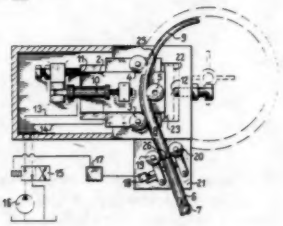
PCT No. PCT/DE85/00403, § 371 Date Dec. 5, 1986, § 102(e) Date Dec. 5, 1986, PCT Pub. No. WO86/04837, PCT Pub. Date Aug. 28, 1986

PCT Filed Oct. 18, 1985, Ser. No. 5,163

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1985, 3505739

Int. Cl.[5] B21D *7/08*; B21B *37/02*

U.S. Cl. 72—10 **5 Claims**



1. A process for bending and coiling wire with at least one cylindrical section and at least one longitudinal section having an increasing or decreasing cross-section over its length wherein the wire is bent while being fed between at least three bending rollers with approximately equal curvature along the range of cylindrical longitudinal sections, comprising the steps of

coiling said wire by feeding said wire between three bending rollers;

changing the amount of bending of the wire during coiling within the range of the longitudinal sections having increasing or decreasing cross sections at a point on the longitudinal section having a variable diameter by means of measuring said change in diameter of said wire by a measuring device and switching from the amount of bending appropriate for the smaller ultimate diameter to the amount of bending appropriate for a larger diameter, or vice versa, based upon said measuring;

the switching taking place at a point at which the minor ultimate diameter of the section having the varying diameter is located a predetermined distance from the bending rollers, which distance is 20% to 60% of the length of the section with the varying diameter.

4,918,959

METHOD FOR PREVENTING THE BUILDUP OF OILY DEPOSITS ON ROLLING MILL SCALE

Dennis P. Paraszak, St. Louis; Charles W. Burkhardt, Fenton, both of Mo., and Rainer Langwald, Oberhausen, Fed. Rep. of Germany, assignors to Petrolite Corporation, St. Louis, Mo.

Filed Feb. 6, 1989, Ser. No. 306,601

Int. Cl.[5] B21B *45/06, 45/08*

U.S. Cl. 72—39 **8 Claims**

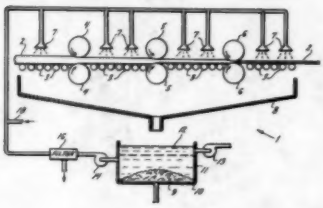
1. A method of preventing the formation of oily mill scale comprising the steps of:

a. hot rolling steel into a shaped object using a series of carrier and heavy rolls journalled such that lubricant used to reduce the journal friction of the rolls is emitted and deposited onto mill scale resulting from the rolling operation;

b. spraying the rolled steel in multiple stages as the steel moves from one heavy roll to another with a solution consisting essentially of a surfactant in an aqueous carrier, said surfactant being present in an amount sufficient to

emulsify the journal lubricant and sprayed with a force sufficient to flake off the mill scale;

c. conveying the sprayed liquid, the emulsified journal lubricant, and the flaked off mill scale together into a container



wherein the mill scale settles to the bottom of the container;

d. separating the sprayed liquid into an aqueous phase and an organic phase; and

e. recovering the mill scale from the bottom of the container

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4,918,960

METHOD FOR REMOVING SCALE FROM A METAL STRIP

Jury V. Lipukhim, ploschad Metallurgov, 5, kv. 15; Leonid I. Danilov, ulitsa Vereschagina, 51, kv. 8; Eduard A. Garber, ulitsa M. Gorkogo, 85, kv. 17, and Anatoly N. Subbotin, prospekt Pobedy, 120, kv. 14, all of Vologodskaya oblast Cherepovets, U.S.S.R.

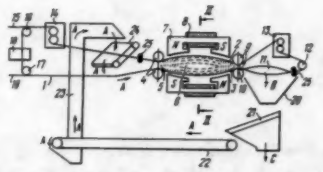
PCT No. PCT/SU88/00012, § 371 Date Sep. 21, 1988, § 102(e) Date Sep. 21, 1988, PCT Pub. No. WO88/05348, PCT Pub. Date Jul. 28, 1988

PCT Filed Jan. 15, 1988, Ser. No. 271,951

Claims priority, application U.S.S.R., Jan. 21, 1987, 4175586

Int. Cl.[5] B21B *45/06*

U.S. Cl. 72—40 **4 Claims**



1. A method of removing scale from a metal strip, comprising the steps of stretching and flattening said strip in a horizontal position first in one direction and then another direction opposite to said one direction in a manner to form spaced, horizontally arranged upper and lower sections of said strip; moving the strip, including the upper and lower sections thereof, through a cleaning zone defined between said strip sections; introducing abrasive ferromagnetic cleaning powder into said cleaning zone; pressing said powder against the surfaces of said upper and lower strip sections during their movement through said cleaning zone to descale said strip; and, withdrawing said powder, scale, and descaled strip from said cleaning zone.

4,918,961

MACHINE FOR SPLINING CLUTCH HUBS WITH CLOSE TOLERANCE SPLINE BELLMOUTH AND OIL SEAL SURFACE ROUNDNESS

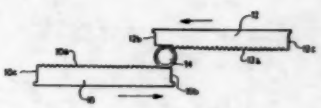
Gary R. Hill, Mt. Clemens, Mich., assignor to Micromatic Textron Inc., Holland, Mich.

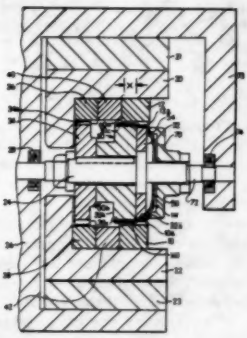
Continuation of Ser. No. 51,316, May 19, 1987, Pat. No. 4,833,905. This application Aug. 24, 1988, Ser. No. 235,958

The portion of the term of this patent subsequent to May 30, 2006, has been disclaimed.

Int. Cl.[5] B21H *5/00*

U.S. Cl. 72—88 **3 Claims**





1. In a machine for forming axially-extending splines on a sleeve of a cup-shaped power transmission member wherein the sleeve is mounted on a rotatable toothed mandrel between a pair of sliding toothed racks which are slidable past opposite sides of the mandrel with the mandrel teeth intermeshing with the rack teeth with the sleeve therebetween and wherein the sleeve has an open end and another end closed by an annular end wall, the improvement comprising the mandrel and pair of racks being in offset relation to one another and the mandrel teeth having an outer periphery which is defined by an imaginary cylinder of a single diameter and which extends axially from a first mandrel end proximate to said annular end wall toward a second mandrel end remote from said annular end wall, said mandrel and pair of racks being offset to such an extent that the second mandrel end includes an annular axially extending portion in non-intermeshing relationship with said pair of racks and having a length for receiving a ring-shaped portion of the sleeve of selected axial length adjacent the open sleeve end, said outer periphery of the mandrel teeth being uninterrupted from the first mandrel end toward the second mandrel end sufficient for the sleeve to extend to said axially extending portion of the second mandrel end, and said mandrel having means for engaging the power transmissionmember of axially position the ring-shaped portion of the sleeve to overlie said axially extending portion so as not to be located between the intermeshing mandrel teeth and rack teeth and thus not splined with the remainder of the sleeve, said selected axial length of the ring-shaped portion not splined being sufficient to reduce bellmouth of the formed splines.

4,918,962

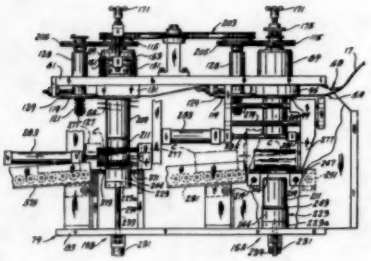
APPARATUS AND METHOD FOR FORMING EDGEWISE WOUND CORES

Harold L. Fritzsche, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 237,042, Aug. 26, 1988, which is a division of Ser. No. 904,140, Sep. 4, 1986, Pat. No. 4,796,451, which is a division of Ser. No. 660,211, Oct. 12, 1984, Pat. No. 4,613,780. This application Mar. 27, 1989, Ser. No. 329,285

Int. Cl.[5] B21C *47/04*

U.S. Cl. 72—134 **29 Claims**



1. A method of forming edgewise wound cores from a generally thin strip of ferromagnetic material at an operation station therefor, the operating station including a stripping arbor vertically movable between a pair of opposite positions, the method comprising the steps of:

deforming the strip generally edgewise thereof into a plurality of helical convolutions at the operation station and receiving the helical convolutions generally in an axial stack thereof about the stripping arbor in one of the opposite positions thereof to effect the formation on the stripping arbor of a respective one of the edgewise wound cores;

moving the striping arbor generally vertically with the respective one edgewise wound core thereon from the one opposite position of the stripping arbor toward the other of the opposite positions thereof and stripping the respective one edgewise wound core from the stripping arbor during the generally vertical movement of the stripping arbor between the one and other opposite positions thereof; and

supporting the respective one edgewise wound core in a preselected stripped position spaced generally vertically between the one and other opposite positions of the stripping arbor upon the occurrence of the stripping step.

4,918,963

RETRACTABLE ROLLING MILL INSTRUMENTATION PLATFORM

Jeffrey L. Manning, Forest, and Clemens F. Zurlippe, Madison Heights, both of Va., assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed May 1, 1989, Ser. No. 345,819

Int. Cl.[5] B21B *37/00*

U.S. Cl. 72—199 **6 Claims**

1. A rolling mill instrumentation platform comprising:

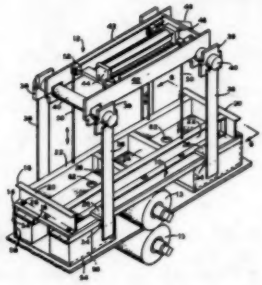
(a) a generally rectangular, rigid plate;

(b) stiffening means fixedly secured to said plate for maintaining the rigidity of said plate;

(c) positioning means for accurately positioning said plate with respect to a rolling mill, said positioning means comprising a first portion secured to said plate and a second portion secured to said rolling mill;

(d) retracting means for retracting said plate from said accurately positioned location, said retracting means comprising a framework secured to said rolling mill;

(e) operating means for moving said plate between its said accurately positioned location and an elevated position above said accurately positioned location; and,



(f) support means for securing instrumentation to said plate, said support means comprising a housing secured to said plate on each side of the longitudinal axis of the monitored roll of said rolling mill, said housings enclosing and protecting the said instrumentation from the adjacent environment of said rolling mill.

4,918,964

ADJUSTING MECHANISM FOR A UNIVERSAL STAND

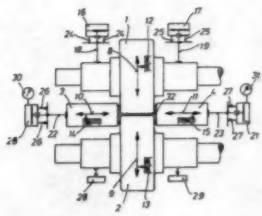
Georg Engel, Kaarst, and Ernst-August Hilberer, Korschenbroich, both of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft

Filed Jan. 22, 1988, Ser. No. 146,952

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1987, 3701889

Int. Cl.[5] B21B *13/10, 37/08*

U.S. Cl. 72—225 **5 Claims**



1. In a universal stand including horizontal rolls and vertical rolls and an adjusting mechanism, wherein the horizontal rolls and the vertical rolls are adjustable by means of combined electromechanic coarse adjustments and hydraulic fine adjustments, the electromechanic coarse adjustment as well as the hydraulic fine adjustment being monitored with respect to position by means of displacement pickups, the improvement comprising

(a) the hydraulic fine adjustments being additionally monitored by means of pressure pickups or rolling force pickups, the hydraulic fine adjustments being operated for the adjustment and opening of the rolls under pressure, and the hydraulic fine adjustments being controlled in accordance with displacement, and

(b) an electronic control device for storing and reproducing all actual values measured by the pickups with respect to position, pressure and rolling force.

4,918,965

MULTIHIGH ROLLING MILL

Kazuo Kobayashi, Naka; Toshiyuki Kajiwara, Hitachi; Teruo Sekiya, Takahagi, and Tomoaki Kimura, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

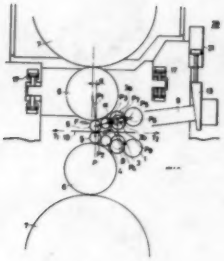
PCT No. PCT/JP87/00574, § 371 Date Feb. 24, 1988, § 102(e) Date Feb. 24, 1988, PCT Pub. No. WO88/00862, PCT Pub. Date Feb. 11, 1988

PCT Filed Jul. 31, 1987, Ser. No. 183,735

Claims priority, application Japan, Aug. 8, 1986, 61-185121

Int. Cl.[5] B21B *13/14*

U.S. Cl. 72—243 **28 Claims**



5. A multi-high rolling mill having a plurality of small-diameter work rolls, a plurality of backup rolls supporting said work rolls and arranged in the substantially vertical direction thereof, intermediate rollers supporting said small-diameter work rolls with respect to the whole length thereof, and support rollers supporting said intermediate rollers; and

each of said support rollers having a plurality of divisional rollers arranged in the axial direction thereof, each of the divisional rollers being arranged in a zigzag manner in accordance with the axial direction of the intermediate roller so that the axes of said divisional rollers are aligned with upper and lower divisional rollers relatively in the vertical direction, and second support rollers being further provided to support the relative upper and lower divisional rollers, commonly.

4,918,966

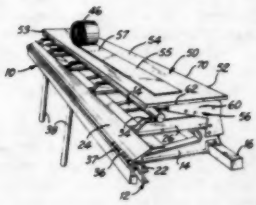
WORK TABLE FOR SHEET METAL BRAKES

Michael G. Raccioppi, Jr., 32 Leswing Ave., Saddle Brook, N.J. 07662

Filed Aug. 21, 1989, Ser. No. 396,363

Int. Cl.[5] B21D *5/02, 43/00*

U.S. Cl. 72—319 **14 Claims**



1. A work table for use in connection with a sheet metal brake having a frame, a clamp extending longitudinally along the frame, and bending means for bending a sheet of metal about a longitudinal bend line when the sheet of metal is held in the clamp, the work table comprising:

a table top extending in a longitudinal direction and having opposite surfaces;

bracket means for mounting the table top upon the frame of the sheet metal brake such that the table top is located above the clamp and the longitudinal direction of the table top is aligned generally parallel to the longitudinal bend line, the bracket means including a support arm extending laterally along the bracket means and providing a generally horizontal support surface for the table top when the bracket means is secured to the frame of the sheet metal brake;

securing means for securing the bracket means to the frame in fixed relationship therewith; and

movable means coupling the table top with the bracket means for movement of the table top relative to the bracket means between a first position wherein the table top is essentially horizontal and one surface of said table top will rest upon the support surface provided by the support arm of the bracket means to overlie the clamp so that the opposite surface of said table top provides an essentially horizontal work surface for the preparation of the sheet of metal to be bent, and a second position wherein the table top is moved away from the clamp to expose the clamp for use in concert with the bending means for bending the prepared sheet of metal;

the bracket means further including means for defining the second position of the table top, said second position being established by said bracket means and one surface of said table top.

4,918,967

FULLY ENCLOSED DIE FORGING APPARATUS

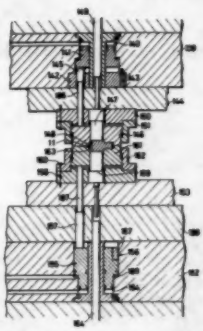
Nobuyuki Ishinaga, Sagamihara, Japan, assignor to Aida Engineering, Ltd., Kanagawa, Japan

Filed Jul. 1, 1988, Ser. No. 214,334

Claims priority, application Japan, Jul. 6, 1987, 62-168318; Apr. 28, 1988, 63-105812

Int. Cl.[5] B21J *13/02*

U.S. Cl. 72—354 **8 Claims**



1. A fully enclosed die forging apparatus comprising a slide having an upside cylinder mechanism, a bolster having an underside cylinder mechanism, an upside die and an underside die disposed opposedly in a vertical direction between said slide and said bolster, an upside cylinder mechanism contained in said slide which urges said upside die downward, an underside cylinder mechanism contained in said bolster which urges said underside die upward, an upside punch inserted in said upside die that moves synchronously with the movement of said slide, an underside punch inserted in said underside die and supported by said bolster, and a cam mechanism intrinsic to and carried by said underside cylinder mechanism independently from said dies for causing both of said punches to accel-

erate into said dies by moving said upside die and said underside die downward at a slower speed than the moving speed of said slide.

4,918,968

APPARATUS AND METHOD OF DETECTING LEAKS IN PRESSURIZED PIPING SYSTEMS

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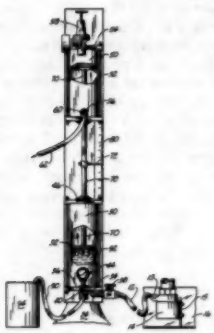
Filed Jul. 10, 1989, Ser. No. 377,879
Int. Cl.[5] G01M *3/26*
U.S. Cl. 73—40 **12 Claims**



1. An apparatus for detecting leaks in a pressurized liquid piping system comprising:

a mounting frame;

a fill cylinder attached to said frame, said fill cylinder including a movable liquid-tight piston disposed therein and being movable between opposite ends of said fill cylinder;

a selectively closable test line port, and a selectively closable liquid product suction port formed in said fill cylinder on one side of said liquid-tight piston, and a vent port formed in said fill cylinder on the opposite side of said liquid-tight piston;

means for connecting said test line port to a pressurized liquid piping system to be tested;

means for connecting said liquid product suction port to a supply of liquid product;

means for determining the pressure of liquid product in the fill cylinder on one side of said liquid-tight piston;

a pressure cylinder attached to said frame and being spaced from and coaxially aligned with said fill cylinder, said pressure cylinder including a movable pressure piston disposed therein and being movable between opposite ends of said pressure cylinder;

a pressure regulator port formed in said pressure cylinder on one side of said pressure piston, and an access port formed in said pressure cylinder on the opposite side of said pressure piston;

a connecting rod attached to and interconnecting said liquid-tight piston and said pressure piston, said rod being disposed to span the space between the fill cylinder and the pressure cylinder;

means for applying a predetermined pressure to one side of the pressure piston through said pressure regulator port;

means for applying pressure to the opposite side of the pressure piston through said access port; and

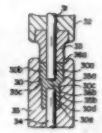
means for indicating the position of said connecting rod relative to the frame in the space between the fill cylinder and the pressure cylinder, whereby movement of the rod toward the fill cylinder indicates a leak in the pressurized liquid piping system being tested.

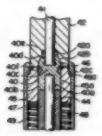
4,918,969

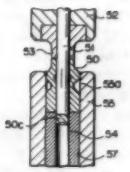
FORGING METHOD FOR A HOLLOW ARTICLE

Hirosato Takeuchi; Yutaka Tanaka; Osahiko Miyazaki; Noboru Saito; Haruo Kubo; Naoyuki Kotake, and Makoto Nagumo, all of Tokyo, Japan, assignors to Nitto Kohki Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 223,151, Jul. 22, 1988, abandoned. This application Jun. 9, 1989, Ser. No. 364,381
Claims priority, application Japan, Jul. 22, 1987, 62-181233
Int. Cl.[5] B21D *28/32*; B21J *5/12*
U.S. Cl. 72—334 **4 Claims**







1. A forging method for a hollow article having a peripheral groove, comprising the steps of:

a first step of disposing a columnar material into a first stepped die with a cavity having large and small internal diameter portions and extruding one end portion of said material with a first punch in a direction opposite to an advancing direction of said first punch to thereby form a first blind hole in the center portion of said material;

a second step of deepening said first blind hole in a second stepped die with a cavity having large and small internal diameter portions and a stepped portion until the hole reaches the proximity of the stepped portion, and extruding the other end portion of said material into the inside of said small internal diameter portion of said cavity with a second punch previously extended thereinto to thereby simultaneously form stepped material having a large outer diameter portion and a small outer diameter portion with a stepped portion therebetween and a second blind hole at said other end portion thereof while leaving a blind portion between said first and second blind holes;

a third step of fitting said first and second blind holes to third punches while exposing in an unsupported manner the outer periphery of the small outer diameter portion of said stepped material from a third die and pressurizing, by means of a sleeve, only an end face portion of said small outer diameter portion formed with said second blind hole to expand said small outer diameter portion of said stepped material toward the outer periphery to form an expanded portion, thereby forming a peripheral groove

between said expanded portion and the stepped portion of said stepped material; and

a fourth step of punching out said blind portion between said first and second blind holes of said stepped material to cause said first and second blind holes to communicate with each other.

4,918,970

FULLY ENCLOSED DIE FORGING APPARATUS

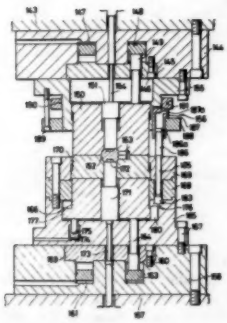
Nobuyuki Ishinaga, Sagamihara, Japan, assignor to Aida Engineering, Ltd., Kanagawa, Japan

Filed Jul. 1, 1988, Ser. No. 214,283

Claims priority, application Japan, Jun. 7, 1987, 62-168317; Apr. 28, 1988, 63-105811

Int. Cl.[5] B21J *13/02*

U.S. Cl. 72—354 **9 Claims**



1. A fully enclosed die forging apparatus comprising a slide having an upside die set plate, a bolster having an underside die set plate, an upside die and an underside die disposed oppositely in a vertical direction between said slide and said bolster, an upside cylinder mechanism disposed on said upside die set plate which urges said upside die downward, an underside cylinder mechanism disposed on said underside die set plate which urges said underside die upward, a support member for supporting the underside die, an upside punch inserted in said upside die that moves synchronously with the movement of said slide, an underside punch inserted in said underside die and supported by said bolster and a cam mechanism, said cam mechanism comprising at least one horizontal cam and at least one vertical cam in contact with said horizontal cam, said support member and horizontal cam being interengaged, at least one push pin having an upper end and a lower end, a push pin cylinder having a piston which abuts the upper end of said push pin for movement thereof synchronously with movement of the slide, the lower end of the push pin contacting the vertical cam for corresponding movement thereof, to cause descending movement of the support in response to movement of the horizontal cam produced by the vertical cam, whereby to cause both of said punches to accelerate into said dies by moving said upside die and said underside die downwardly at a slower speed than the moving speed of said slide.

4,918,971

BENDING TOOL

Osamu Makino, 1-15-3, Bubai-cho, Fuchu-shi, Tokyo, Japan

Filed Mar. 13, 1989, Ser. No. 322,610

Claims priority, application Japan, Apr. 22, 1988, 63-98074

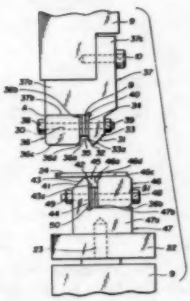
Int. Cl.[5] B21D *5/01*

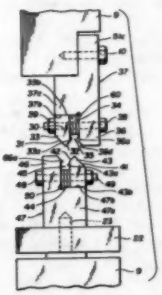
U.S. Cl. 72—389 **5 Claims**

1. A bending tool for a bending press, comprising:

a first die having a first die body, and a blade provided at one end of said first die body as one bending member, said blade having a pointed edge with a bending angle of about 90°, said pointed edge disposed so that the bending angle is bisected by a vertical center line of said blade, the blade in cross section having a longer side on an outside thereof and a shorter side on an inside thereof, a first bending block disposed in relation to said first die body at a position laterally spaced from the shorter side of said blade as another bending member, said first bending block having a rectangular end face opposing the shorter side of said blade, and a first gap having a predetermined depth and an adjustable width between the blade and the first bending block;

a second die having a second die body, and a blade provided at one end of said second die body as one bending member, said blade having a pointed edge with a bending angle of about 90°, said pointed edge is disposed so that the bending angle is bisected by a vertical center line of said blade, said blade in cross section having a longer side on an outside thereof and a shorter side of an inside thereof,





a second bending block disposed in relation to said second die body at a position laterally spaced from the shorter side of said blade as another bending member, said second bending block having a rectangular end face opposing the shorter side of said blade, and a second gap having a predetermined depth and an adjustable width disposed between the blade and the second bending block;

spacers inserted between the blades and the bending blocks in each of the first and second dies; wherein,

said first and second dies are disposed in moveable opposition to each other in a manner such that a perpendicular bisector extending through an apex of a bending edge of the blade of the first die passes substantially to a center of said second gap, while a perpendicular bisector extending through an apex of the bending edge of the blade of the second die passes substantially to a center of said first gap,

wherein, in at least one of said first and second dies, either a bending member of a blade or a bending block is formed

integral with the die body and the other bending member is removably mounted of the die body by fastening means, said die body having a flat surface extending horizontally from a base of the bending member integrally formed with the die body to a lateral end of the die body, and further, a base end surface of the bending member removably mounted on the die body is engaged with said horizontally extending flat surface.

4,918,972

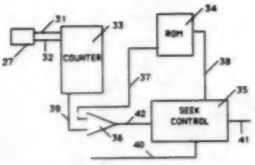
DUAL REFERENCE TRACK SCHEME

Philip Kenny, Los Altos; Dan Cautis, San Mateo, and John Bizjak, San Jose, all of Calif., assignors to Brier Technology, Inc., San Jose, Calif.

Filed Nov. 10, 1988, Ser. No. 269,585

Int. Cl.[5] G01B *21/10*

U.S. Cl. 73—1 R **7 Claims**



1. A method for calibrating a servo head and a data head having a fixed relationship with each other, said method comprising the steps of:

providing a plurality of servo tracks on a storage media;

providing a first reference track on said storage media;

providing a second reference track on said storage media;

defining an anchor servo track as a servo track beneath said servo head when said data head is positioned over said first reference track;

generating a servo track count by counting servo tracks crossed by said servo head when said data head is moved from said first reference track to said second reference track;

comparing said servo track count to a stored track count, said stored track count representing the number of servo tracks crossed when a distance between said servo head and said data head is a nominal value;

generating a first error signal by taking the difference between said servo track count and said stored track count, said difference proportional to a difference in separation between said servo head and said data head from said nominal value.

4,918,973

APPARATUS AND METHOD FOR CALIBRATING A MEASURING DEVICE

Richard M. Kruse, Wichita, Kans., assignor to Great Plains Industries, Inc., Wichita, Kans.

Filed Mar. 18, 1988, Ser. No. 170,315

Int. Cl.[5] G01F *25/00*

U.S. Cl. 73—3 **6 Claims**

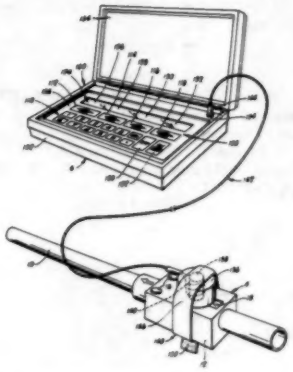
2. An apparatus for calibrating a flowmeter which includes a body and an electromagnetic member disposed in the body, said apparatus comprising:

calibration means for providing a calibration signal characterized as electrical pulses;

electromagnetic means, connected to said calibration

means, for transmitting electromagnetic pulses in response to said electrical pulses; and connecting means for connecting said electromagnetic

means to the body of the flowmeter so that the electromagnetic member of the flowmeter is responsive to said electromagnetic pulses, said connecting means includes a strap, including two ends and having said electromagnetic means connected thereto intermediate said two ends, said



two ends adapted to be secured together after said strap is wrapped around the body of the flowmeter.

4,918,974

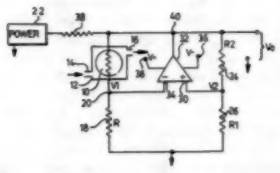
METHOD AND APPARATUS FOR THE MEASUREMENT OF THE THERMAL CONDUCTIVITY OF GASES

Raynald Hachey, Shipshaw; Daniel Lamarre, Duberger, and Jacques Marcotte, Jonquiere, all of Canada, assignors to Alcan International Limited, Montreal, Canada

Filed Feb. 6, 1989, Ser. No. 307,318

Int. Cl.[5] G01N *25/36*

U.S. Cl. 73—27 R **18 Claims**



1. A method for the measurement of gas thermal conductivity employing a katharometer including:

supplying electric power to a single katharometer element having a temperature/resistance characteristic to heat it to a predetermined temperature value and a corresponding resistance value;

passing a test gas whose thermal conductivity is to be measured over the katharometer element to thereby change its temperature from the predetermined value and its resistance from the corresponding value;

employing the change of resistance of the element to change the supply of electrical power to the element to restore its temperature to the predetermined value and its resistance to the corresponding value; and

measuring the amount of power supplied to the element with its temperature restored to the predetermined value to determine the test gas thermal conductivity;

wherein the test gas whose conductivity is to be measured is entrained in a carrier gas;

the method employing two measurements spaced in time to determine the proportion of the test gas entrained in the carrier gas;

the method including circulating the carrier gas through the

katharometer element and a probe in contact with the test gas for a first period of time sufficient to entrain the test gas in the carrier gas to form a mixture of gases, and thereafter making a first measurement;

thereafter purging the katharometer with carrier gas to remove the gas mixture and making a second measurement within a short period of time after the first measurement; and

employing the first and second measurements to eliminate the temperature of the katharometer element body as a variable from the gas thermal conductivity measurement.

4,918,975

METHOD AND APPARATUS FOR TESTING FLUID-FILLED SYSTEMS FOR LEAKS

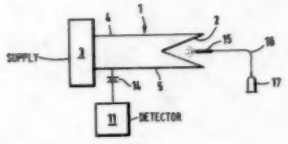
Günter Voss, Much, Fed. Rep. of Germany, assignor to Leybold Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Mar. 31, 1988, Ser. No. 175,800

Claims priority, application European Pat. Off., Mar. 31, 1987, 87104737.9

Int. Cl.[5] G01M *3/20*

U.S. Cl. 73—40.7 **19 Claims**



1. A method of determining the presence of a leak in a system containing a fluid, which at least has a liquid phase, comprising:

exposing a part of the system to be tested to a test gas, passing the fluid past a membrane separator, and sampling for the presence of the test gas that has passed through the membrane separator with the aid of a detector sensitive to the test gas.

4,918,976

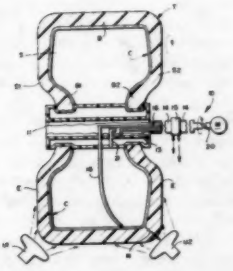
METHOD OF INSPECTING TIRES FOR DEFECTS

Robert D. Fogal, Sr., Chambersburg, Pa., assignor to International Marketing, Inc., Chambersburg, Pa.

Continuation-in-part of Ser. No. 337,215, Apr. 12, 1989. This application Jul. 21, 1989, Ser. No. 383,122

Int. Cl.[5] G01M *3/04, 17/02*

U.S. Cl. 73—40.7 **34 Claims**



25. A method of inspecting a tire for defects comprising the steps of applying a first coating material which accentuates defects under ultraviolet light to an interior surface of a tire, applying ultraviolet light to an exterior surface of the coated tire whereby coating material which has migrated through a defect in the tire to the exterior is accentuated and thereby readily detected, applying a second coating material which is an admixture of a material which accentuates defects when influenced by predetermined electromagnetic wavelengths and a tire sealant which will seal the tire defects during migration therethrough to the interior surface of the tire, buffing the exterior tread surface of the tire, and applying the predetermined electromagnetic wavelengths to the buffed exterior tread surface of the coated tire whereby the defect accentuation material of the second coating which has migrated through a defect in the tire is accentuated and thereby readily detected.

4,918,977

LIQUID LEAKAGE DETECTOR LINE

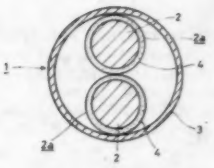
Yasuhiko Takahashi, Nara; Kunimitsu Tamura, Higashiosaka; Nagato Niimura, Urawa; Keizo Asao, Matsubara; Teruyosi Honoki, Higashiosaka; Tadaaki Masui, Osaka, and Masuo Ishizaka, Higashiosaka, all of Japan, assignors to Tatsuta Electric Wire and Cable Co., Ltd., Osaka, Japan

Filed Sep. 30, 1987, Ser. No. 103,478

Claims priority, application Japan, Sep. 30, 1986, 61-151258[U]; Sep. 30, 1986, 61-151259[U]; Sep. 30, 1986, 61-151260[U]; Sep. 30, 1986, 61-151261[U]; Sep. 30, 1986, 61-151262[U]; Sep. 30, 1986, 61-151263[U]; Nov. 13, 1986, 61-174698[U]

Int. Cl.[5] G01M *3/18*

U.S. Cl. 73—40.5 R **18 Claims**



1. A liquid leakage detector line comprising:

a pair of wiry electrodes each including a conductor covered with an insulator layer made of a macromolecular material including an ester bond and adapted to dissolve in the presence of strong acids or alkalis, said wiry electrodes being disposed substantially in parallel with each other; and

a liquid-absorbent material covering said pair of wiry electrodes.

4,918,978

MEANS AND METHOD FOR DETECTING LEAKS IN TANKS

Marion C. Green, 1999 Amidon Suite 208, Wichita, Kans. 67203

Filed Mar. 20, 1989, Ser. No. 326,230

Int. Cl.[5] G01M *3/32*

U.S. Cl. 73—49.2 **19 Claims**

1. A system for detecting leaks in a tank, or the like, comprising an excavation basin in a ground having a surface and including a periphery and defining a generally saucer-like formation with a basin surface which slopes from said periphery;

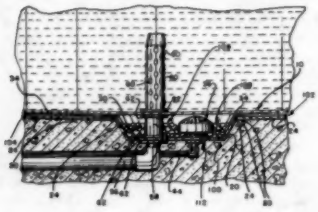
tank supported by said excavation basin, said tank having a permeation barrier extending from the periphery of the basin excavation and supported by and conforming to the basin surface of the saucer-like formation, an impervious corrosion curtain integrally bound to said permeation barrier at the periphery of the basin and defining an upright side wall of the tank, particulate matter supported by said permeation barrier, a liquid-impervious liner continu-

ously extending from the top of and down said corrosion curtain up-right side wall and across the top of the particulate material that is being supported by the permeation barrier;

liquid-leakage receiver positioned in said particulate matter; said liquid-leakage receiver comprising a receiver base having a solid outside wall, a solid inside wall generally concentrically disposed with respect to said solid outside wall, and a hub generally concentrically disposed with respect to said solid outside wall and said solid inside wall;

monitor conduit bound to said receiver and piercing the barrier and extending under the excavation basin outwardly therefrom beyond the periphery of said excavation basin;

and a leak-check tube attached to said monitor conduit under the ground and projected upwardly therefrom beyond the surface of the ground.



4,918,979

LIQUID TESTING APPARATUS

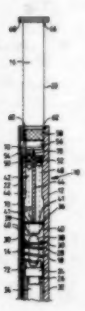
Derry F. Pearce, Airport West; Eugene Dimitriadis, Clayton, and James R. Starkey, Mulgrave, all of Australia, assignors to Godfrey Howden Pty. Ltd., Australia

Filed May 31, 1988, Ser. No. 200,161

Claims priority, application Australia, May 29, 1987, PI2219/87

Int. Cl.[5] G01N *29/02*

U.S. Cl. 73—61.1 R **17 Claims**



1. Liquid testing apparatus including a housing comprising means defining at least one chamber capable of receiving liquid to be tested, optically transparent reflecting means in the housing and having a plurality of reflecting surfaces in said means defining at least one chamber, light transmitting means in the housing for radiating light onto said reflecting means, reflected light receiving means in the housing for receiving light from the transmitting means which has been reflected on said plurality of surfaces and means for converting said reflected light into a first electrical signal indicative of the refractive index of the liquid, means in the housing for generating at least one sonic pulse and for transmitting same through liquid to be tested in said means defining at least one chamber, means in the housing for generating a second electrical signal indicative of the sonic velocity of the liquid and derived from said at least one transmitted pulse, means in the housing for sensing the temperature of the liquid under test, means in the housing for generating a third signal dependent on the temperature sensed and means for transmitting said first, second and third signals for determining the quality of the tested liquid.

4,918,980

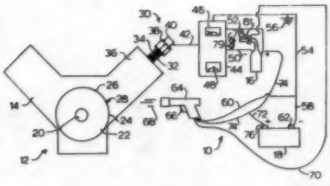
DIESEL ENGINE TIMING APPARATUS AND METHOD

Theos E. Theofanous, 4747 Kester Mill Rd., Winston-Salem, N.C. 27103

Filed Nov. 15, 1988, Ser. No. 271,497

Int. Cl.[5] G01M *15/00*

U.S. Cl. 73—119 A **12 Claims**



1. A diesel engine timing light assembly for a diesel engine system including a high voltage coil and a power supply, said timing assembly comprising:

(a) a luminosity probe comprising a housing adapted to be mountable in a glow plug opening of a selected cylinder of a diesel engine, said housing comprising a light-transmissive housing portion adapted to transmit light from combustion of fuel in said selected cylinder into the housing;

(b) a photocell mountable in the luminosity probe housing for receiving light transmitted into the housing and generating an on or off signal depending on the respective presence or absence of light received by the photocell;

(c) an inductive pick-up, strobe-type timing light operatively connectable (1) to said coil by an electrical wire joined at one end thereof to the timing light and attachable at an opposite end thereof to a positive secondary terminal of the coil and (2) to said power supply; and

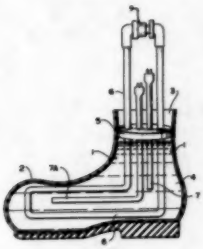
(d) an amplifier operatively attachable: (i) in signal receiving relationship to said photocell, for receiving said on or off signal therefrom, and amplifying same to produce an on or off output signal; (ii) to said power supply; and (iii) to said coil by: (A) a first electrical wire joined at one end thereof to the amplifier and attachable at an opposite end thereof to said positive secondary terminal of the coil; and (B) a second electrical wire joined at one end thereof to the amplifier and attachable at an opposite end thereof to a negative secondary terminal of the coil, the first and second electrical wires, at their said one ends joined to the amplifier, being in electrical connection with amplifier circuitry means for generating said on or off output signal, and with said amplifier being attachable to said photocell by a third electrical wire connectable at one end thereof to the amplifier circuitry means and at an opposite end thereof to said photocell, so that said on or off output signal is transmittable from the amplifier to the coil, to generate a corresponding voltage signal which is inductively transmittable from the coil to said timing light when operatively connected therewith.

4,918,981

METHOD FOR MEASURING MOISTURE VAPOR TRANSMISSION RATE IN WEARING APPAREL

Robert W. Gore, Newark, Del., assignor to W. L. Gore & Associates, Inc., Newark, Del.

Filed Oct. 28, 1988, Ser. No. 263,931
Int. Cl.[5] G01M 3/26
U.S. Cl. 73—76 3 Claims



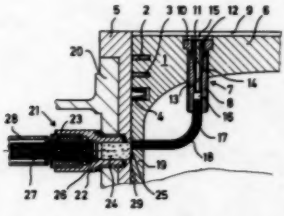
3. The method of claim 1 or 2 wherein the liner material is microporous expanded polytetrafluorethylene.

4,918,982

DEVICE FOR MEASURING AND TRANSMITTING THE COMBUSTION RADIATION IN THE COMBUSTION CHAMBER OF COMBUSTION ENGINES

Franz Pischinger, Aachen; Ulrich Spicher, Stolberg, and Georg Heuser, Aachen, all of Fed. Rep. of Germany, assignors to FEV Motorentechnik GmbH & Co. KG, Aachen, Fed. Rep. of Germany

Filed Jan. 23, 1989, Ser. No. 299,443
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1988, 3801949
Int. Cl.[5] G01M 15/00
U.S. Cl. 73—116 6 Claims



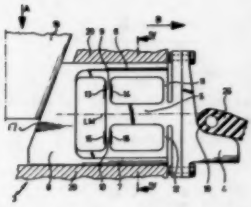
1. A device for measuring and transmitting combustion radiation occurring in the combustion chamber of a combustion engine having a fixed part and at least one part moveable relative to the fixed part for together defining the combustion chamber, said parts having confronting relatively slideable surfaces defining a gap therebetween, the device comprising at least one optical sensor mounted in said movable part and facing said chamber, an optical light guide extending from said sensor and terminating at said gap, said light guide having a surface area at said gap for emitting signals from said chamber representing the combustion radiation, and an optical receiver mounted in said fixed part and terminating at said gap opposite said optical light guide for receiving and transmitting said signals.

4,918,983

APPARATUS FOR CHECKING MOTOR VEHICLE TIRES

Günther Himmler, Darmstadt, Fed. Rep. of Germany, assignor to Gebr. Hofmann GmbH & Co. KG Maschinenfabrik, Pfungstadt, Fed. Rep. of Germany

Filed Apr. 28, 1989, Ser. No. 344,593
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1988, 3814646
Int. Cl.[5] G01M 17/02
U.S. Cl. 73—146 8 Claims



1. Apparatus for checking a motor vehicle tire comprising:
clamping means disposed in a circular array and adapted to be displaced in a radially outward direction to bear against the internal bead of a tire to be checked;
force measuring means each associated with a respective clamping means and adapted, in the radially outward movement of the clamping means, to detect the compression force applied to the respective inner circumferential angular region of the tire bead by each clamping means, each force measuring means including a measuring body, a frame structure radially movably guided in the measuring body, a substantially central force transmission portion connected to the respective clamping means to be disposed within said frame structure, a plurality of resiliently bendable support portions supporting said force transmission portion is relation to said frame structure and extending substantially perpendicularly to the direction of the applied force, and strain gauges carried on respective ones of said support portions and connected to form a measuring bridge; and
a display means for displaying the detected compression forces.

4,918,984

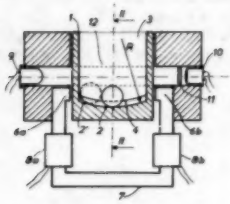
DEVICE FOR MEASURING THE MODIFICATION TIME OF THE PHYSICAL STATE OF A FLUID MEDIUM

Jean-Luc Martinoli, Villeneuve La Garenne; Alain Rousseau, both of Paris, and Pascal Vilain, Hadancourt le Haut Clocher, all of France, assignors to Serbio, France

Filed Dec. 30, 1988, Ser. No. 292,171
Claims priority, application France, Dec. 30, 1987, 87 18348; Jul. 6, 1988, 88 09151
Int. Cl.[5] G01N 11/10
U.S. Cl. 73—64.1 10 Claims

1. An apparatus for determining the time of change of the physical state of a fluid sample comprising:
(i) a container for holding the fluid sample, said container having a bottom;
(ii) a ferromagnetic member movable in the bottom of the container along a predetermined curvilinear path;
(iii) means for generating a periodic magnetic field coupled to said ferromagnetic member, said periodic magnetic field imparting to said ferromagnetic member a sustained pendular motion along said path, said periodic magnetic field having a period substantially equalling the natural

period of pendular motion of said ferromagnetic member along said path within said fluid sample and



(iv) detecting means for detecting the variations of the amplitude and/or the frequency of said pendular motion during said time of change.

4,918,985

DYNAMIC BALANCING SYSTEM OVERCOMING AERODYNAMIC FORCES

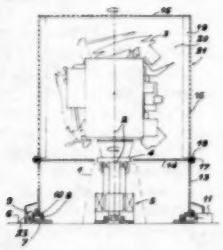
Robert Rollet, La Roquette/Siagne, France, assignor to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Jan. 10, 1989, Ser. No. 295,490

Claims priority, application France, Jan. 12, 1988, 88 00269

Int. Cl.[5] G01M *1/16*

U.S. Cl. 73—471 **6 Claims**



1. A system designed to eliminate the aerodynamic forces which are exerted on an object in rotation about a fixed axis, comprising first motive means, a shaft rotated by the first motive means about the axis and to which the object is fixed, the system comprising a chamber which encloses the object and is rotated about the fixed axis by second motive means, wherein the chamber has a circumferential wall provided with generally radial and vertical blades which extend inwardly from the wall.

4,918,986

QUICK-CLAMPING FIXTURE WITH CENTERING FEATURE FOR CLAMPING VEHICLE WHEELS ON THE SPINDLE OF A BALANCING MACHINE

Horst Warkotsch, Schulze-Delitzsch-Str. 21, 3006 Burgwedel 1, Fed. Rep. of Germany

Filed Feb. 6, 1989, Ser. No. 306,709

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1988, 3808755

Int. Cl.[5] G01M *01/02*

U.S. Cl. 73—487 **4 Claims**

1. In a quick-clamping fixture having centering means for clamping a vehicle wheel on the spindle of a balancing machine comprising

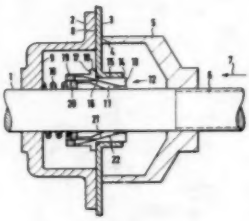
a flange fixed to said spindle for contact with the center portion of said vehicle wheel,

a nut threaded on said spindle for moving said wheel toward said fixed flange,

a clamping collet slidably mounted on said spindle which fits inside a flanged cylindrical opening in said center portion of said vehicle wheel, and

a spring on said spindle for urging said clamping collet into engagement with said cylindrical opening in said wheel, the improvement in which

said clamping collet is a two part collet having an inner part



with an outer conical surface and an outer part with a complementary inner conical surface which surfaces slide over each other as the parts are urged toward each other by said spring to expand the collet

said outer part having an external cylindrical surface which mates with said flanged cylindrical opening in said center portion of said vehicle wheel,

one of said collet parts having a contact surface for abutting said spring and the other of said collet parts having a surface abutting a counterbearing.

4,918,987

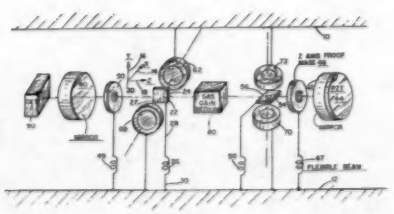
LASER ACCELEROMETER

Frederick Vescial, Orange, and Frederick Aronowitz, Laguna Niguel, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 19, 1988, Ser. No. 144,999

Int. Cl.[5] G01P *15/13*

U.S. Cl. 73—517 B **12 Claims**



1. A laser accelerometer comprising:

an optical cavity characterizing a frame having an input axis (x), a cross axis (y) orthogonal to and co-planar with said input axis and a (z) axis passing through the intersection of said (x) and (y) axes, said (z) axis being orthogonal to the plane of said (x) and (y) axes;

an (x) axis proof mass having a predetermined blanking surface;

a flexible beam having a first end coupled to said (x) axis proof mass and a second end coupled to said frame, deflection of said flexible beams permitting a predetermined range of movement of said (x) proof mass on said input axis in a direction opposite to sensed acceleration of said frame;

a laser light source having a mirror means within said cavity

for providing a light ray coaxially aligned with said (z) axis, said laser source being characterized to have a transverse electromagnetic field characteristic having a null intensity region centered on the (z) axis, said mirror means transmitting a light ray therethrough;

detector means having at least a first detector on a sensitive plane, said plane being normal to said (z) axis, said detector being positioned to be centered to said light ray and responsive to said transmitted light ray intensity signal;

bias and amplifier means coupled to said detector means for providing a bias current to said first detector and for amplifying said intensity signal, said intensity signal being characterized to have a magnitude related to the intensity of said transmitted light ray;

said (x) axis proof mass blanking surface being centrally positioned within and normal to said light ray null intensity region to provide increased blanking of said light ray in response to transverse movement of said mass on said input axis, said (x) axis proof mass deflecting said flexible beam and moving said blanking surface in a direction transverse to said light ray to partially blank said light ray in response to acceleration in the direction of said input axis (x);

control means responsive to said intensity signal for applying an (x) axis restoring force to restore said (x) axis proof mass to said central position and for providing an (x) axis output signal proportional to the restoring force.

4,918,988

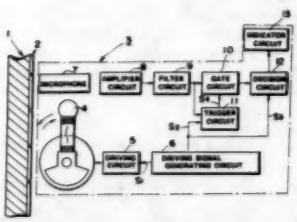
METHOD OF DETECTING A DEFECTIVE POSITION IN A CEMENT INTIMATE MIXTURE FILLED PORTION IN A BUILDING

Masaaki Ebihara, Kasukabe, and Kyosuke Nomura, Musashino, both of Japan, assignors to Taisei Corporation, Tokyo, Japan

Continuation of Ser. No. 137,508, Dec. 23, 1987, abandoned. This application Feb. 24, 1989, Ser. No. 316,608

Int. Cl.[5] G01M *7/00*

U.S. Cl. 73—594 **14 Claims**



1. A method of testing for a defective position in a cement intimate mixture comprising the steps of:

(a) tapping a surface of the cement intimate mixture to be tested;

(b) converting a tapping sound generated by the tapping to a tapping sound signal which exhibits an attenuation characteristic;

(c) passing said tapping sound signal through a gate circuit having a passing characteristic substantially corresponding to a reverse of an attenuation characteristic in a perfect cement intimate mixture thereby to inhibit passing of a tapping sound signal which would be produced in the case of a perfect cement intimate mixture and also to inhibit passing of a tapping sound signal generated at the instant of the tapping;

(d) obtaining at least one of a peak value of an amplitude or an integrated value of the signal after passage thereof through said gate circuit; and

(e) comparing said peak value of the amplitude or said integrated value with a reference value to determine whether a defective portion exists in the cement intimate mixture.

4,918,989

ULTRASONIC METHOD OF MEASURING THE THICKNESS OF THE PLATING ON A METAL TUBE, THE CORRESPONDING APPARATUS AND ITS APPLICATION TO ZR PLATED ALLOY TUBES

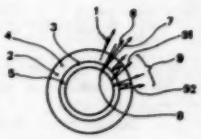
Didier Desruelles, Albertville; André Bodin, and Philippe Moisard, both of Montreuil Juigné, all of France, assignors to Compagnie Europeenne du Zircouium - CEZUS, Courbevoie, France

Filed Mar. 9, 1989, Ser. No. 321,071

Claims priority, application France, Mar. 30, 1988, 88 04726

Int. Cl.[5] G01N *29/00*

U.S. Cl. 73—627 **17 Claims**



1. A method for non-destructive measuring a thickness of a plating metallurgically bonded on metal tubes, said each tube having a core with an acoustic impedance, and said plating with a thickness of at least 0.4 mm and an acoustic impedance interfacing said core impedance, wherein said plating impedance differs from said core impedance by at least 1.0%, said method using an emitter-receiver transducer in immersion positioned outside said tube for producing ultrasonic waves to generate at least a single echo through said tube, wherein said method comprises the following steps:

selecting a properly dampened transducer with a principal resonance frequency between four and 20 MHz as said emitter-receiver transducer;

positioning said transducer in relation to said tube at a distance as well as orientation to generate a distance parameter and orientation parameter, wherein said parameters with the produced ultrasound waves form a signal-to-noise ratio which is increased by adjusting said parameters; and

determining the thickness of said plating from at least one double echo or a triple echo generated at said interfacing of said plating and said core, wherein said double and triple echoes correspond respectively to two or three return paths of the ultrasonic waves having the same travel time but a different reflexion-transmission chronology.

4,918,990

ULTRASONIC TRANSDUCER ASSEMBLY

Kenneth A. Fowler; Dana R. Patch, both of Medfield, and Frederick H. Hotchkiss, Harvard, all of Mass., assignors to Panametrics, Inc., Waltham, Mass.

Continuation of Ser. No. 19,003, Feb. 26, 1987. This application May 8, 1989, Ser. No. 350,218

Int. Cl.[5] B23K *11/30*

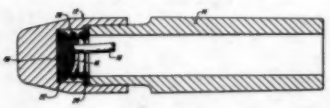
U.S. Cl. 73—629 **10 Claims**

1. An ultrasonic transducer assembly for use within a welding electrode structure, wherein said welding electrode structure can be disassembled and includes a welding electrode tip detachably fitted to a shank, the electrode tip having a front surface adapted for welding a workpiece and a rear surface distal from the front surface, the ultrasonic transducer assembly comprising:

A. transducer means, including a transducer element, de-

tachably positionable inside the electrode tip, between the shank and the rear surface of the electrode tip, and having a front surface, for generating, transmitting and receiving ultrasonic waves, said transducer means further including a rigid support element having front and rear surfaces and a peripheral flange, said rear surface of said support element being joined to said front surface of said transducer element, and said front surface of said support element being adapted for detachably contacting the rear surface of the electrode tip, so that said transducer means can be detachably coupled to the rear surface of the electrode tip, and

B. biasing means, interposed between said transducer means



and the shank, for generating a biasing force between the shank and the electrode tip and biasing said front surface of said transducer means into contact with the rear surface of the electrode tip, so that said transducer means is acoustically and detachably coupled to the rear surface of the electrode tip, said biasing means including a compression spring for generating said biasing force, said compression spring being located between the shank and the support element flange, said compression spring having first and second ends, said first end bearing against said flange, and said second end bearing against the shank, so that said biasing force is transmitted from the shank to said flange, and said transducer element is isolated from said biasing force.

4,918,991

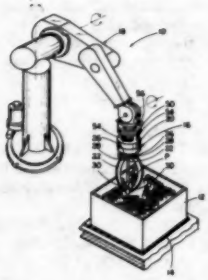
METHOD FOR SAMPLING NUCLEAR FUEL PELLETS WITH A ROBOT GRIPPER MECHANISM

George D. Bucher, McCandless Twp., Allegheny County; John T. DiGrande, Imperial, both of Pa.; Lester C. Frye, Irmo, S.C., and Mark S. Stoutamire, Bridgeville, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 936,561, Dec. 1, 1986, Pat. No. 4,830,565. This application Dec. 7, 1988, Ser. No. 280,867

Int. Cl.[5] G21C *21/00*

U.S. Cl. 73—864 **9 Claims**



4. A method of gently burrowing a plurality of angularly displaced gripping fingers into a stack of nuclear fuel pellets and grasping a pellet located at a predetermined depth in the stack, comprising the steps of:

(a) lowering said fingers into the stack of pellets toward the predetermined depth therein;

(b) rotating said fingers in a first direction relative to the stack and at a first predetermined speed concurrently as said fingers are being lowered into the stack;

(c) pausing said lowering of said fingers;

(d) rotating said fingers in a second direction opposite to said first direction relative to the stack and at a second predetermined speed faster than said first speed concurrently as said fingers are paused;

(e) repeating steps (a) through (d) until said desired predetermined depth is reached; and

(f) closing said fingers upon reaching said predetermined depth to grasp a pellet located at said depth in the stack of pellets.

4,918,992

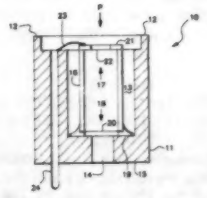
HIGH PERFORMANCE GLASS TO METAL SOLDER JOINT

Milton W. Mathias, El Paso, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 117,776, Nov. 5, 1987, abandoned. This application Mar. 14, 1989, Ser. No. 324,987

Int. Cl.[5] G01L *7/08, 9/06*

U.S. Cl. 73—727 **7 Claims**



1. A pressure sensor comprising:

a semiconductor die including a pressure sensing means, wherein said pressure sensing means is exposed at a surface of said die;

a glass member having first and second opposed ends, wherein said first end is bonded to said semiconductor die so that said first end surrounds said pressure sensing means on said surface of said semiconductor die, and wherein substantially all of the surface of said glass member at said second end is coated with a solder wetable material which includes titanium;

a metal member having a solder wetable area, wherein said solder wetable area will, when adjacent said second end, substantially cover at least said surface of said glass at said second end; and

a solder joint between said second end and said solder wetable area, wherein said solder is the sole means of support provided to said joint.

4,918,993

METHOD OF GAUGING PRE-EXISTING IN-SITU STRESS FROM AN EXTRACTED SAMPLE

David R. Hughson, 217 Rosedale Heights Drive, Toronto, Ontario, Canada (M4T 1C7)

Filed Aug. 21, 1987, Ser. No. 88,154

Claims priority, application United Kingdom, Aug. 21, 1986, 8620389

Int. Cl.[5] G01N *3/06*

U.S. Cl. 73—801 **1 Claim**

1. An apparatus for testing a prepared specimen comprising:

at least a pair of platens each including a hard, flat and smooth loading face with at least one of the faces being perpendicular to a compressive axis of the apparatus and another of the faces being optionally free to rotationally adapt to a plane of a specimen end cap;

means for applying gradually and substantially uniformly

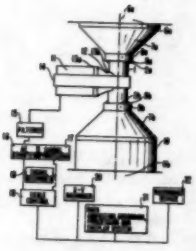
increasing compressive force on the specimen by moving in a relative manner the loading faces towards each other;

means for measuring a compressive force applied by the loading faces to the specimen; and

a single acoustic emission detecting device for mounting directly on an intermediate portion of a cylindrical face of the specimen, the detecting device including:

an acoustic emission transducer for converting pulses emitted by such specimen under stress into detectable electronic signals;

means for holding said detecting device in contact with such specimen;



means for electronically filtering said electronic signals to pass only those signals in a frequency range typical of acoustic emission signals; and

means for cumulatively counting a number of said signals passed by said filter means; and

wherein an interface is defined between said detecting device and such specimen being tested, and further comprising a wave guide provided at a detecting end of said detecting device, said wave guide including:

an end conforming to a cylindrical side wall shape of such specimen, and

a couplant interposed between said wave guide and a detecting end of said detecting device and also between said wave guide and the specimen.

4,918,994

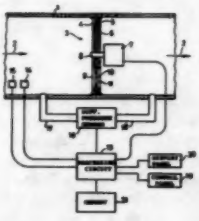
GAS METER

Albert Kramer, De Bilt, Netherlands, assignor to EMS Holland B.V., De Bilt, Netherlands

Continuation-in-part of Ser. No. 52,792, May 21, 1987, abandoned. This application Dec. 2, 1988, Ser. No. 279,549

Int. Cl.[5] G01F *1/40*

U.S. Cl. 73—861.53 **15 Claims**



1. A method for measuring a quantity of gas flowing per unit time through a pipe provided with an adjustable restriction having a plurality of selectable different restriction areas and having means for measuring the pressure difference across the restriction, comprising the steps:

(a) establishing for each selectable different restriction area a range of measurable pressure differences, each range having upper and lower pressure difference limits,

(b) measuring the pressure difference across a selected restriction,

(c) if the measurement difference is larger than the upper limit for the currently selected restriction, selecting the next restriction whose area is larger than that of the currently-selected restriction, if the measured pressure difference is smaller than the lower limit for the currently-selected restriction, selecting a preceding restriction whose area is smaller than that of the currently-selected restriction,

(d) measuring the actual pressure difference across the last-selected restriction,

(e) determining the quantity per unit time of flowing gas by multiplying the actual pressure difference measured in step (d) by a factor determined by the last-selected restriction area.

4,918,995

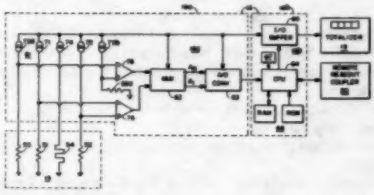
ELECTRONIC GAS METER

Arthur N. J. Pearman, St. Paul; Gerald D. Hunter, Lino Lakes; Michael A. Woessner, Golden Valley, and Robert E. Gilman, St. Michael, all of Minn., assignors to Gas Research Institute, Chicago, Ill.

Filed Jan. 4, 1988, Ser. No. 140,714

Int. Cl.[5] G01F *1/68*

U.S. Cl. 73—861.02 **21 Claims**



1. A compact gas meter for measuring usage of natural gas or the like by a consumer over a time interval to enable billing of the consumer by a utility, comprising: a housing having a passageway therethrough with a gas inlet adapted for connection to a source of natural gas provided by the utility and a gas outlet adapted for connection to gas utilization means of the consumer, gas flow sensing means mounted on said housing and including a solid state flow sensor having a substrate bearing a thin film heating element and first and second thin film temperature sensing elements flanking said heating element, and means locating said flow sensor in said passageway to directly sense gas flow through said passageway, said flow sensor being oriented to extend generally coplanar with the direction of flow of the gas through said passageway, with one of said temperature sensing elements located upstream of the gas flow through said passageway and the other one of said temperature sensing elements located downstream of the gas flow, said flow sensor being operable when energized to provide an output signal indicative of gas flow rate through said passageway, signal processing circuit means mounted within said housing and electrically connected to said flow sensor, said signal processing circuit means including signal sampling means for periodically sampling the output signal provided by said flow sensor during sampling periods and generating a signal representative of gas flow volume over a predetermined time interval, power switch means responsive to said signal sampling means for energizing said flow sensor during said sampling periods, said signal sampling means defining operating cycles for said power switch means, each operating cycle including an active period of a given duration and an inactive period of a substantially longer duration, said power switch means energizing said flow sensor enabling said flow sensor to

provide its output signal only during the active period of each operating cycle, and indicating means controlled by said sampling means to provide an indication of the gas flow volume measured by the gas flow sensor.

4,918,996

TURBINE FLOWMETER

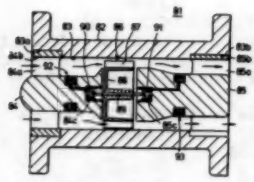
Takashi Kato, Kawasaki; Yutaka Morita, Takarazuka; Takeshi Yamaguchi, Kyoto; Kazuo Tsuge, Yokohama; Kyoji Imamura, Yokohama; Yoshio Kawai, Yokohama; Hiroaki Hasegawa, and Hiroyuki Amemori, both of Kawasaki, all of Japan, assignors to Osaka Gas Co., Ltd., Osaka and Tokico Ltd., Kawasaki, both of, Japan

Filed Sep. 30, 1987, Ser. No. 106,175

Claims priority, application Japan, Sep. 30, 1986, 61-231527; Sep. 30, 1986, 61-150145[U]

Int. Cl.[5] G01F *1/10*

U.S. Cl. 73—861.91 **1 Claim**



1. A turbine flowmeter comprising:

an impeller rotatably provided within a flow passage through which a fluid to be measured flows, said impeller comprising a rotary shaft which rotates together with said impeller;

a pair of bearing members having bearing surfaces for axially supporting said rotary shaft;

oil accumulating means for accumulating a lubricating oil therein;

oil supplying means for supplying the lubricating oil in said oil accumulating means in small quantities to the bearing surface of at least one of said bearing members; and

an upstream side supporting member provided on an upstream side of said impeller and a downstream side supporting member provided on a downstream side of said impeller,

each of said upstream and downstream side supporting members having a space in which said bearing member is mounted, said oil accumulating means being provided within each of said upstream and downstream side supporting members, said oil supplying means comprising capillary means opening in a vicinity of said bearing surface, a communicating hole in each of said upstream and downstream side supporting members for enabling communication between said oil accumulating means and said space and a fiber yarn provided inside said communicating hole for supplying the lubricating oil in said oil accumulating means in small quantities to the bearing surface of the corresponding bearing member through said capillary means due to a capillarity introduced in said capillary means.

4,918,997

VERNIER TORQUEMETER

Jean Pouillange, Gressy, France, assignor to CGEE Alsthom, Perret, France

Filed Mar. 17, 1988, Ser. No. 169,535

Claims priority, application France, Mar. 17, 1987, 87 03638

Int. Cl.[5] G01L *3/10*

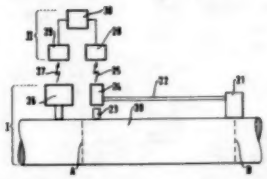
U.S. Cl. 73—862.34 **7 Claims**

1. A device for measuring an angle of twist between first and second sections (A, B) of a shaft, while the shaft is rotating, the device being characterized in that it comprises:

first means (21) fixed to the shaft at said second section for generating information representative of the phase at said second section and transmitting said information to the vicinity of said first section;

a first heteropolar vernier inductor (23, 24) including a component which is fixed to said shaft at said first section for receiving said information from said first means and transmitting said information in the form of a first resulting magnetic induction (25);

a first stationary bi-polar receiver (28) picking up said first magnetic induction and providing an output signal;



a secondary stationary bi-polar receiver (29) picking up second magnetic induction (27) provided by second means (26) on the shaft and providing an output signal constituting a phase reference; and

a phase comparator (30) receiving said output signals from said receivers at inputs thereof and providing an output signal proportional to the phase difference between said signals, and thus to said angle of twist.

4,918,998

MOTOR-SPEED REDUCER DEVICE INCLUDING SAFETY MEANS FOR DRIVING AN ELEMENT

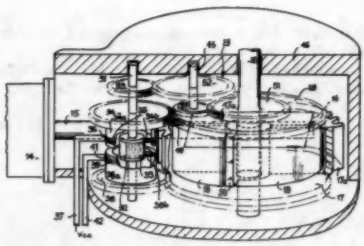
Pierre Periou, Cergy Pontoise, France, assignor to Rockwell-CIM, France

Filed Nov. 7, 1988, Ser. No. 267,868

Claims priority, application France, Nov. 23, 1987, 87 16211

Int. Cl.[5] G01L *3/14*

U.S. Cl. 73—862.34 **5 Claims**

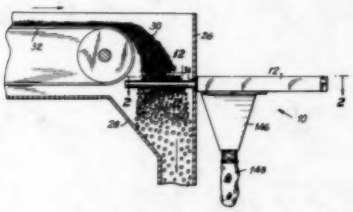


1. A motor-speed reducer device comprising: a driving input shaft, an output shaft, a deformable coupling coupling the input shaft to the output shaft, said coupling including a worm and a speed reducer driven by the worm, and a sensor for detecting torque between the input shaft and the output shaft during operation of the device and causing deformation of the coupling, said sensor including a pair of cheeks with each cheek fixed to an end of one of said input and output shafts, two electrically conductive tracks with each track extending along a portion of a circumference of one of said cheeks, a coil spring having one end attached to one of said cheeks and another end attached to the other cheek and an electrical circuit connected to said tracks and including means for monitoring the torque detected by said sensor.

4,918,999
SAMPLER FOR SOLID MATERIALS

Hugo Wenshau, Dallas, and Grant G. Rice, Arlington, both of Tex., assignors to Intersystems, Inc., Omaha, Nebr.

Filed Apr. 28, 1989, Ser. No. 345,018
Int. Cl.[5] G01N *1/20*
U.S. Cl. 73—863.54 16 Claims



1. A sampler comprising
a support frame,
probe means mounted on said support frame, with said probe means including a probe cavity portion formed thereon,
translational drive means mounted on said support frame,
first connection means connecting said translational drive means and said probe means for extension of said probe means and retraction of said probe means relative to said support frame,
rotational drive means mounted on said support frame,
second connection means connecting said rotational drive means and said probe means for rotation of said probe means relative to said support frame,
mounting means for mounting said support frame on a product flow chute, and
control system means for control of said extension of said probe means into said product flow chute and into a stream of product flow, followed by rotation of said probe with said probe cavity directed substantially toward said stream of product flow to receive a sample of said product flow, further rotation of said probe means with said probe cavity directed partially away from said product stream, followed by retraction of said probe means away from said product flow chute and followed by further rotation of said probe means to discharge said sample of said product.

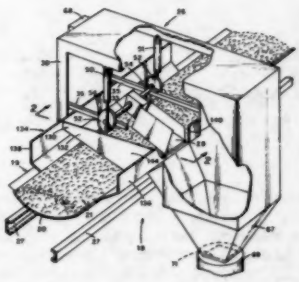
4,919,000
CONVEYOR BELT CROSS-STREAM SAMPLING SYSTEM AND ASSOCIATED METHOD

John B. Long, 421 Heron Hill Dr., Louisville, Tenn. 37777

Filed Jun. 6, 1989, Ser. No. 363,544
Int. Cl.[5] G01N *37/00*
U.S. Cl. 73—863.91 11 Claims

1. A system for taking a cross-stream increment of bulk material carried along a moving conveyor belt comprising:
a sampler;
means for moving the sampler across the moving conveyor belt at substantially a right angle with respect to the direction of movement of bulk material carried by the belt so that when operatively moved across the belt, the sampler passes through the bulk material in a manner segregating and removing a cross-stream increment of bulk material from the belt and leaving a path in the material having an upstream and downstream edge;
said sampler including an upstream side oriented generally perpendicular to the flow of bulk material on the belt, a downstream side and a back plate joining the upstream and downstream sides and oriented substantially perpendicular to the upstream side, each of said upstream and downstream sides including a leading edge for entering the bulk material in advance of the remainder of the upstream and downstream sides and the back plate and wherein the leading edges of the upstream and downstream sides are contained generally in a plane oriented substantially parallel to the back plate so that the upstream side provides the surface area of said sampler projected upstream of the bulk material flow; and
said downstream side joined to said back plate so as to define an acute interior angle therewith so that for a preselected sample-accepting capacity of said sampler at a predetermined spacing between said leading edges of said upstream and downstream side plates, the upstream projected area of said sampler is relatively small as compared to a sampler wherein said upstream and downstream sides are parallel.

6. A system for taking a cross-stream increment of bulk material carried along a moving conveyor belt comprising:
a sampler including an upstream side having a surface facing generally upstream of the flow of bulk material along the moving conveyor belt;
means for supporting the sampler generally above the conveyor belt;
means for moving the sampler across the conveyor belt at substantially a right angle with respect to the direction of movement of bulk material flow so that when operatively moved across the belt, the sampler passes through the bulk material in a manner segregating and removing a cross-stream increment of bulk material from the belt; and
means associated with said sampler support means and positioned upstream of the sampler for limiting the buildup of bulk material against the upstream side surface of the sampler when the sampler is positioned within the flow of the bulk material so that when bulk material has built up against the upstream side surface of the sampler by a predetermined amount, additional bulk material buildup is intercepted by said limiting means.



9. A system for taking a cross-stream increment of bulk material moving along a conveyor belt comprising;
a sampler;
means for supporting the sampler for rotation about an axis so that when rotated, the sampler moves across the conveyor belt at substantially a right angle with respect to the direction of movement of bulk material flow and passes through the bulk material in a manner segregating and removing a cross-stream increment of bulk material from the belt;
means for rotating the sampler about its rotation axis so that during a pass of the sampler through the material, the sampler enters the bulk material at one side of the belt corresponding to an entry-side of the belt and exits the bulk material at the other side of the belt corresponding to an eject-side of the belt;
collection mean for collecting the cross-stream increment removed from the belt by the sampler and having an opening positioned adjacent the eject-side of the belt for

receiving the cross-stream increment of bulk material removed from the belt by the sampler;

control means associated with said rotating means for halting the rotation of said sampler and disposing said sampler in a parked position adjacent the eject-side of the belt upon completion of an increment-collecting cycle so that ingress of bulk material into the collection means opening from the belt between increment-collecting cycles is restricted by the sampler; and

skirt means disposed adjacent said eject-side of the belt and including spaced-apart panels extending generally upwardly from the belt to define said opening therebetween for accommodating passage of the sampler therethrough during an increment-collecting cycle, said panels cooperating with said sampler when said sampler is in its parked position to restrict entry of bulk material into said opening when said sampler is in said parked position.

4,919,001

COARSE/FINE ADJUSTMENT COAXIAL HANDLE FOR FEEDING MICROSCOPE STAGE

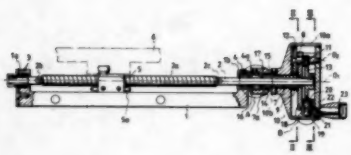
Takashi Ogiwara; Kesao Isono, both of Ina, and Masahide Katagiri, Hachiouji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 7, 1988, Ser. No. 254,923

Claims priority, application Japan, Oct. 9, 1987, 62-255614; Oct. 9, 1987, 62-255615

Int. Cl.[5] G02B *21/26*; F16H *37/06*; G05G *11/00*

U.S. Cl. 74—10.52 **4 Claims**



1. A coarse/fine adjustment coaxial handle for feeding microscope stage comprising a feed screw shaft rotatably supported on a base block and screwed in a stage supporting member, a tubular member rotatably fitted over said feed screw shaft and equipped with a first disc plate fixed to the tubular member at one end thereof, a fine adjustment knob rotatably fitted over said tubular member and having an outer circumferential wall surrounding said first disc plate, a reduction gear mechanism including a intermediate gear pivoted on said first disc plate and interposed between said fine adjustment knob and said feed screw shaft, a first frictional resistance to said tubular member with an elastic pressing member interposed between the other end of said tubular member and said base block, a second disc plate rotatably fitted within said fine adjustment knob and connected to said first disc plate, and a coarse adjustment handle pivoted to an eccentric position on said second disc plate.

4,919,002

STEPLESS SPEED CHANGE APPARATUS

Takeshi Kume, Amagasaki, Japan, assignor to T.K.M. Engineering Kabushiki Kaisha, Amagasaki, Japan

Filed Feb. 22, 1989, Ser. No. 313,747

Claims priority, application Japan, Feb. 23, 1988, 63-41610; Aug. 31, 1988, 63-219499

Int. Cl.[5] F16H *15/08*

U.S. Cl. 74—199 **7 Claims**

1. A stepless speed change apparatus comprising:

a frame;

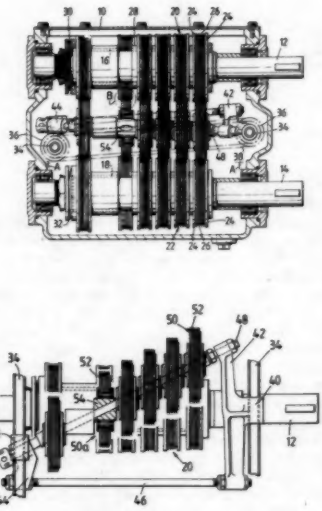
first and second parallel shafts journaled on said frame;

a plurality of first disc means mounted on said first shaft so as to rotate therewith;

a plurality of second disc means mounted on said second shaft so as to rotate therewith;

said first and second disc means having diameters increasing axially in the opposite directions to each other;

an intermediate shaft supported on said frame between said parallel shafts at an angle to a plane containing the axes of the parallel shafts, said intermediate shaft being adapted to shift in a direction transverse to said plane;



a plurality of intermediate disc means of the same diameter, which are mounted rotatably on said intermediate shaft with their axes in parallel to said parallel shafts, each of said intermediate disc means being aligned radially with one of said first disc means and one of said second disc means; and

whereby any one of said intermediate disc means can, depending on the position of said intermediate shaft, engage with the aligned first and second disc means at their peripheries.

4,919,003

VIDEO GAME AND THE LIKE CONTROL ASSEMBLY

James L. Lawson, Liverpool, and David C. Harris, Dewitt, both of N.Y., assignors to The Torrington Company, Torrington, Conn.

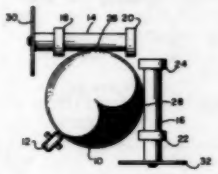
Continuation of Ser. No. 505,339, Jun. 17, 1983, abandoned. This application Jan. 31, 1986, Ser. No. 823,988

Int. Cl.[5] G05G *9/00*

U.S. Cl. 74—471 XY **1 Claim**

1. In combination: a manual control ball rotatable in any direction at variable speeds; a pair of perpendicular rotatable shafts each contacting the control ball at a control ball-shaft contact point, each rotatable shaft having a pair of circumferential grooves, one circumferential groove being axially spaced on the opposite side of the control ball-shaft contact point from the other circumferential groove, said circumferential grooves providing inner ball raceways; a pair of outer

bearing rings on each shaft, each ring having an inner circumferential groove forming an outer ball raceway, balls located in



the raceways; and an encoder disk mounted on each rotatable shaft.

4,919,004

SPEED CHANGE OPERATING DEVICE

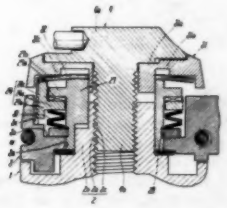
Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Division of Ser. No. 79,465 Jul. 30, 1987, Pat. No. 4,815,330, which is a division of Ser. No. 665,941, Oct. 29, 1984, Pat. No. 4,751,850. This application Oct. 20, 1988, Ser. No. 260,058

Claims priority, application Japan, Apr. 3, 1984, 59-67162; Apr. 3, 1984, 59-67163; Jul. 25, 1984, 59-156222

Int. Cl.[5] G05G *9/00*

U.S. Cl. 74—475 9 Claims



1. A speed-change operating device adapted to switch a derailleur from one to another of plural speed stages of a bicycle, said derailleur having a return spring for returning the derailleur to a rest position, said speed-change operating device comprising:

a base member adapted to be supported on said bicycle, said base member having a lever shaft,

an operating lever rotatably supported on said lever shaft and adapted to actuate said derailleur,

a friction mechanism for applying to said lever a rotational resistance adapted to overcome a bias supplied by said return spring of said derailleur,

a positioning mechansim for positioning said lever at one of said plural speed change stages, said positioning mechanism including a positioning member having a plurality of engaging portions oriented substantially on a circle centered around said lever shaft and an engaging member engageable with at least one of said engaging portions, and

an operating mechansim to select between an operating mode and an non-operating mode for said positioning mechanism for positioning said lever, wherein said operating lever includes a boss and said speed-change operating device further comprises an adjusting screw member screwably engaged with said lever shaft of said base member and a cap member non-rotatably supported relative to said base member and axially movable relative to said lever shaft of said base member, said positioning mechanism being interposed between said boss and said cap member, said cap member being axially movable relative to said lever shaft of said base member responsive to screwing movement of said adjusting screw member relative to said lever shaft of said base member to enable said friction mechanism to move selectively toward and away from said operating lever to select an actuation mode of one of said friction mechanism and said positioning mechanism.

4,919,005

DEVICE FOR ACTUATING AN INCOMPRESSIBLE DRIVE CABLE

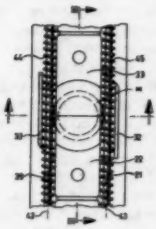
Bernd Schleicher, Munich, Fed. Rep. of Germany, assignor to Webasto AG Fahrzeugtechnik, Gauting, Fed. Rep. of Germany

Filed Mar. 21, 1989, Ser. No. 326,725

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1988, 3809949

Int. Cl.[5] F16C *1/10*; B60J *7/057*

U.S. Cl. 74—501.6 10 Claims



1. Device for actuating at least one incompressible helically threaded drive cable, that is axially movable for displacing a movable part in a vehicle body, comprising a drive pinion seated on a drive shaft and a cable guideway for guiding the drive cable in proximity to the drive pinion, wherein the cable guideway has boundary edges that, in use, contact the drive cable and form a slope angle, with respect to a longitudinal axis of the drive cable, which is other than 90 degrees, and form an acute approach angle that is enclosed between said boundary edges of the cable guideway and sections of turns of the helical thread which face them, said approach angle being larger than an acute elevation angle that is enclosed between the turns of the helical thread and a plane which extends perpendicularly relative to the longitudinal axis of the drive cable.

4,919,006

VISCOUS DIFFERENTIAL

Mark A. Willett, Novi, and James P. McCarthy, Milford, both of Mich., assignors to GKN Automotive, Inc., Auburn Hills, Mich.

Filed Jan. 22, 1988, Ser. No. 147,295

Int. Cl.[5] F16H *35/04*

U.S. Cl. 74—650 41 Claims

1. A limited slip viscous differential between a first axle, a second axle, and a third axle, comprising:

a housing having a first end and a second end, said housing having a first axle hub at said first end thereof for receiving said first axle, said housing having a second axle hub at said second end thereof for receiving said second axle, said housing further having an inner surface of cylindrical shape;

first connection means on said housing for rotatably connecting said housing to said third axle;

a first drum rotatably mounted in said housing adjacent said first end thereof, said first drum having an outer surface spaced from said inner surface of said housing, said outer surface of said first drum and said inner surface of said housing defining a first chamber;

second connection means on said first drum and said first axle for causing said first drum to rotate with said first axle and for permitting said first axle to be slidable relative to said first drum;

a second drum rotatably mounted in said housing adjacent said second end thereof, said second drum having an outer surface spaced from said inner surface of said housing, said outer surface of said second drum and said inner surface of said housing defining a second chamber;

third connection means on said second drum and said second axle for causing said second drum to rotate with said second axle and for permitting said second axle to be slidable relative to said second drum;

an annular bulkhead disposed in said housing between said first and second drums and separating said first chamber from said second chamber, said annular bulkhead having a cut-out provided diametrically therethrough;

at least one thrust block inserted in said cut-out to maintain a predetermined interaxial space between the adjacent ends of said first and second axles;

a first set of first drum annular plates attached to said outer surface of said first drum;

a second set of first drum annular plates attached to said inner surface of said housing, said second set of first drum annular plates interleaving said first set of first drum annular plates;

a first set of second drum annular plates attached to said outer surface of said second drum;

a second set of second drum annular plates attached to said inner surface of said housing, said second set of second drum annular plates interleaving said first set of second drum annular plates; and

a high viscosity fluid contained in said first and second chambers for transferring torque from said third axle to at least one of said first and second axles when at least one of said first and second axles rotate at an angular velocity different from that of said housing.

4,919,007

CONTINUOUSLY VARIABLE TRANSMISSION WITH FORWARD AND REVERSE GEARING

Frederik E. C. Van Der Hardt Aberson, Eindhoven, and Siebren C. Van Der Veen, Veldhoven, both of Netherlands, assignors to Van Doorne's Transmissie B.V., Tilburg, Netherlands

Continuation of Ser. No. 463,301, Feb. 2, 1983, abandoned. This application Apr. 1, 1986, Ser. No. 846,839

Claims priority, application Netherlands, Feb. 15, 1982, 8200564

Int. Cl.[5] F16H *37/08*

U.S. Cl. 474—72 **3 Claims**

1. A transmission comprising a centrifugal drive away clutch means having an input shaft, a forward and reverse reduction gear means connecting the input shaft to a primary shaft of an infinitely variable V-belt transmission such that the input shaft and primary shaft are arranged in a spaced parallel relationship, said reduction gear means being provided with a shifting means slidable on a shaft coaxially arranged with the input shaft, to shift the gearing means from forward to reverse position, the reduction gear means including a first gear of a forward gear train and a first gear of a reverse gear train, said first gears of said gear trains being selectively engageable by said slidable shifting means and being mounted on said coaxial shaft for rotation relative thereto whereby said coaxial shaft rotates freely with low inertia when said drive away clutch is disengaged, the V-belt transmission having a secondary shaft coupled to the primary shaft by the V-belt and further connected to an output shaft of the transmission.

4,919,008

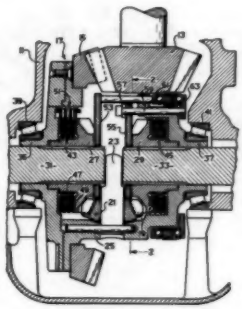
DIFFERENTIAL SMART CLUTCH WITH GEAR REACTION

Edward J. Goscenski, Jr., Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Feb. 10, 1988, Ser. No. 154,395

Int. Cl.[5] F16H *1/44*

U.S. Cl. 475—234 **16 Claims**



1. A differential gear mechanism of the type including a gear case defining a gear chamber; a differential gear arrangement disposed in said gear chamber, said differential gear arrangement including at least one pinion gear and a pair of bevel side gears in meshing engagement with said pinion gear; clutch means operable between a disengaged condition and an engaged condition, effective to retard relative rotation between said gear case and each of said side gears, said clutch means comprising at least a pair of clutching surfaces with each of said side gears disposed to be engaged in response to movement of each of said side gears toward an adjacent surface of said gear case; and actuating means for actuating said clutch means, said actuating means comprising a fluid pressure actuated displacement mechanism operable to achieve an output displacement in response to an external fluid pressure input signal, characterized by:

(a) said fluid pressure actuated displacement mechanism being disposed external to said gear case; and

(b) said actuating means including means operable in response to said output displacement to exert an axially outward biasing force on said side gears, aiding a normal biasing force exerted by each of said side gears on the respective clutching surfaces, as a result of gear reaction forces, during differentiation.

4,919,009

TWO TURBINE VARIABLE SPEED FLUID COUPLING MARINE TRANSMISSION

Neil A. Newman, Omro, Wis., and Thomas C. Bowen, Thousand Oaks, Calif., assignors to Brunswick Corporation, Skokie, Ill.

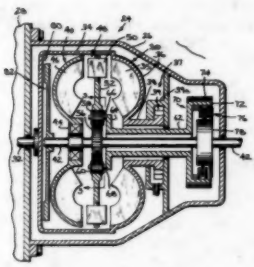
Filed Aug. 16, 1988, Ser. No. 232,703

Int. Cl.[5] F16H *47/08*

U.S. Cl. 475—44 **13 Claims**

1. In a marine drive for a boat, said marine drive including an engine and a propulsion unit, the improvement comprising a fluid coupling interposed in the marine drive between the engine and the propulsion unit, said fluid coupling comprising:

a rotatable fluid pump connected to the engine;
a rotatable forward turbine adapted to be driven in a first rotational direction by said fluid pump;
a rotatable reverse turbine adapted to be driven by said fluid pump;
a rotatable output shaft drivingly connectable to said forward and reverse turbines and coupled to said propulsion unit;
selective engagement means for selectively engaging said forward and reverse turbines with said output means for selectively imparting rotation to said output means in either a first or a second rotational direction; and



counterrotation means provided between said reverse turbine and said output shaft so that, when said reverse turbine is selectively engaged with said output shaft, said output shaft is driven in a rotational direction opposite said first direction of rotation of said forward turbine, said counterrotation means comprising a planetary gearset, including a ring gear to which said reverse turbine is mounted, a sun gear mounted at its center to said output shaft, and two or more planet gears disposed between said sun gear and said ring gear.

4,919,010

TRANSMISSION APPARATUS AND METHOD

Edward G. Trachman, Birmingham; Shan Shih, Troy, and John Arzoian, Dearborn, all of Mich., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jul. 3, 1985, Ser. No. 751,582
Int. Cl.[5] F16H *57/10*
U.S. Cl. 475—281 **5 Claims**

1. Transmission apparatus comprising a first planetary gear set having a first sun gear, first planet gears, a first planet gear carrier, and a first ring gear, a second planetary set comprising a second sun gear, second planet gears, a second planet gear carrier and a second ring gear, a clutch connected to the second ring gear and to the second sun gear for selectively locking the second ring and sun gears and thereby locking the second planetary set, a brake connected to the second sun gear, a one-way clutch connected to the brake, plural input means connected to the first planetary set and output means connected to the second planetary set.

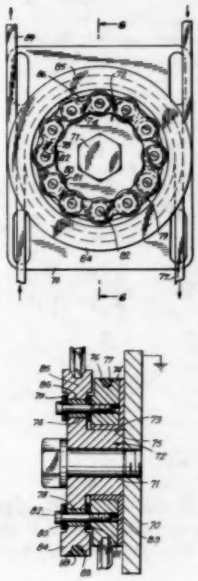
4,919,011

ROLLER SPEED REDUCTION DRIVE

Dennis E. Kemp, Jr., Maplewood, N.J., assignor to Mark T. Basseches, Pleasantville, N.Y., a part interest

Filed Jan. 3, 1989, Ser. No. 292,920
Int. Cl.[5] F16H *13/06, 55/49*
U.S. Cl. 475—183 **4 Claims**

1. A gearless planetary speed reducer comprising a frame, a stator having an arcuate surface fixed to said frame, drive roller means having a drive surface surrounding said stator and circular in transverse section supported by said frame for rotation about a main axis coincident with the radius of said arcuate surface, said drive surface and arcuate surface defining an annular space therebetween, output drive means supported by said frame for rotation about said main axis, and a plurality of planetary roller means fixed to said output drive means for



rotation about axes spaced from said main axis, said planetary roller means being disposed in said annular space and including peripheral portions in frictional driving contact with said arcuate surface and said drive surface.

4,919,012

PILOT OPERATED SOLENOID VALVE IN AN AUTOMATIC TRANSMISSION CONTROL CIRCUIT

Ralph C. Bolz, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Mar. 1, 1989, Ser. No. 317,400
Int. Cl.[5] B60K *41/06*
U.S. Cl. 74—866 **11 Claims**

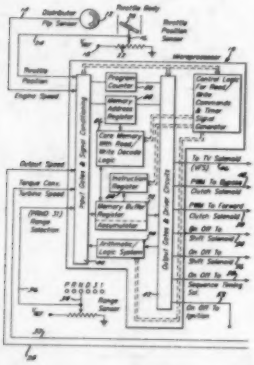
1. In a control system for an electronically controlled automatic transmission having multiple ratio gearing, fluid pressure operated clutch and brake servos for controlling the relative motion of the gear elements to effect ratio changes, a control pressure passage communicating with said servos, a control pressure pump and a fluid pressure regulator valve communicating with said control pressure passage for maintaining a predetermined control system pressure, the improvement comprising:
a throttle valve assembly including;
a pressure regulating throttle valve in communication with said regulator valve, including a pressure inlet port in said throttle valve communicating with said control pressure passage, a low pressure port in said throttle valve communicating with a low pressure region of said control system, a valve spring acting on said throttle valve, a throttle valve outlet pressure port and a throttle valve outlet pressure area on said throttle valve communicating with said outlet pressure port thereby establishing a pressure modulating function;
a pilot valve assembly comprising a valve orifice, a valve

element registering with said valve orifice and adapted thereby to control the flow through said orifice;

a solenoid actuator having an armature engagable with said valve element, a spring acting on said armature whereby the effective solenoid force acting on said valve element is the algebraic sum of the solenoid electromotive force and the actuator spring force;

an exhaust port communicating with one side of said valve element, a control pressure chamber, means for distributing a regulated control pressure of reduced value to said pressure chamber, said regulated control pressure acting on the other side of said valve element and on said throttle valve; and

a microprocessor controller with input signal sensors for said solenoid actuator including means for developing a solenoid actuator voltage signal in response to varying transmission operating variables whereby said pilot valve assembly establishes a throttle valve actuating function in response to solenoid force changes of reduced magnitude.

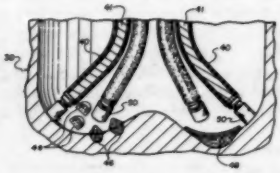


4,919,013

PREFORMED ELEMENTS FOR A ROTARY DRILL BIT

Redd H. Smith, and Jeffrey B. Lund, both of Salt Lake City, Utah, assignors to Eastman Christensen Company, Salt Lake City, Utah

Filed Sep. 14, 1988, Ser. No. 244,122
Int. Cl.[3] B21K 5/02; B22F 7/00
U.S. Cl. 76—108.2 **19 Claims**



1. A process for the production of a rotary drill bit having abrasion and erosion resistant internal watercourses therein for conveying fluid from the interior of the bit to the surface thereof, comprising the steps of:

(a) providing a hollow mold for molding at least a portion of the drill bit;

(b) providing one or more flexible or moldable tubular elements corresponding to said internal watercourses to be formed and positioning said elements within said mold, said elements being fabricated of a hard metal powder dispersed in a polymeric binder;

(c) positioning a bit blank at least partially within said mold;

(d) packing said mold with a powdered matrix material; and

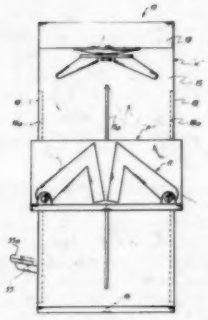
(e) infiltrating said powdered matrix material and said tubular elements with a binder in a furnace to form said bit, the heat from said furnace burning out said polymeric binder in said elements.

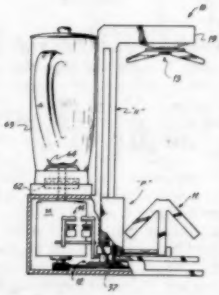
4,919,014

BOTTLE CLOSURE OPENER

Joseph Chen, and Isabelita H. Chen, both of #4 Lantawan St., Quezon City, Philippines

Filed May 22, 1989, Ser. No. 355,284
Claims priority, application Philippines, Jun. 6, 1988, 37014
Int. Cl.[5] B67B 7/18
U.S. Cl. 81—3.2 **4 Claims**





1. A bottle closure opener for use in screw type bottle caps comprising:

(a) a housing having a front panel provided with an elongated vertical opening disposed at the mid-section thereof, a rear wall disposed proximate said front wall, opposed side walls with vertical grooves disposed at the outer surfaces thereof, a base, and a ceiling case;

(b) a bottle platform having an L-shape body formed by a bottle seat and a vertical case provided with vertical guide blocks adapted to be slidably held on the vertical grooves of said walls, said vertical case having a vertical slit disposed at the mid-section thereof and aligned with the elongated vertical opening on said front panel;

(c) a bottle body clamping unit comprising a pair of opposed identical bottle clamps of V-shape formation laterally disposed on said bottle seat, the lower ends of each of said bottle clamps being fixedly secured on a clamp shaft ex-

tending to the inside of said vertical case, a bottle clamping mechanism being operably held and concealed within said vertical case, said mechanism comprising identical sector-gear type clamp levers fixedly secured at the rear ends of said clamp shafts, identical sector-gear type relay levers pivotally held on said vertical case, the gear teeth of said relay levers meshing with the gear teeth of said clamp levers, and the outer ends of said relay levers provided with slots disposed in a superimposed relation with each other to define a space coincident with the vertical slit on said vertical case;

(d) a driving mechanism consisting of a vertical drive shaft journalled for rotation at the rear end of and aligned with the elongated vertical opening of said front panel, said drive shaft provided with a drive shaft gear integrated with a lower clutch member having a clutch lining at its lower end and drivingly connected to a reversible motor, and a drive pinion gear at its upper end thereof, a helically threaded hollow shaft having an unthreaded lower portion telescopically received on said drive shaft, the upper end of which abuts an annular shoulder disposed at a distance below the top end of said drive shaft, an upper clutch member integrated at the lower end of said unthreaded portion in vertical alignment with said lower clutch member, a clutch spring provided at the upper end of said drive shaft, a screw nut screwably engage on said threaded hollow shaft, said screw nut having an attached nut finger extending through the vertical slit on said vertical case of said bottle platform;

(e) a bottle cap opener unit driven by a gear train supported within said ceiling case and having its final gear drivingly connected to said drive shaft, said final gear being rotatably keyed to a vertically slidably cap opener pin having a reduced lower square portion and coaxially aligned with the center between said bottle clamps, and cap opener blades suspendedly supported on said reduced square portion; and

(f) control switches comprising a "down" switch and an "up" switch operably connected to a reversible motor, said "down" switch being actuated by a switch arm to drive said driving mechanism to move down said screw nut and bottle platform, and said "up" switch being actuated by switch lever having a screw nut lifter normally positioned at the lower end of the unthreaded portion of said hollow shaft to raise said screw nut to move up said screw nut and bottle platform.

4,919,015

SCREW CAP OPENER

Jukka K. Pohjola, Oskelantie 1 A 7, 00320 Helsinki, Finland

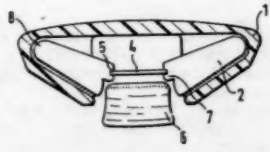
PCT No. PCT/FI87/00145, § 371 Date Mar. 29, 1989, § 102(e) Date Mar. 29, 1989, PCT Pub. No. WO88/03511, PCT Pub. Date May 19, 1988

PCT Filed Oct. 30, 1987, Ser. No. 334,976

Claims priority, application Finland, Apr. 11, 1986, 864474

Int. Cl.[5] B67B 7/18

U.S. Cl. 81—3.44 **6 Claims**



1. A screw cap opening device comprising a cylindrical body (1) having downwardly slanting spokes (3) formed on the inside surface thereof, said spokes having recesses, and positioned therein, upwardly turning pressing parts (2) adapted to squeeze against sides of the screw cap to be opened when said device is pressed against the top of the screw cap.

4,919,016

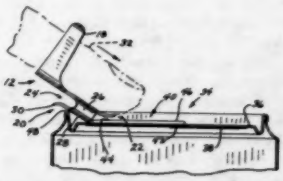
TAB TOP BEVERAGE CONTAINER OPENER

John C. Hanegraaf, Rt. 4 Otte Ct., Appleton, Wis. 54915

Filed Feb. 14, 1989, Ser. No. 311,072

Int. Cl.[5] B67B 7/00

U.S. Cl. 81—3.55 **11 Claims**



1. An opener tool for use in opening cans of the type having a lid with a scored closure for inward displacement by a pivotable tab, said tab including a lever end and an opener end, with the lever end of the tab being adapted for pivoting upwardly in an arcuate path to move the opener end of the tab downwardly into displacing engagement with the closure, said opener tool comprising:

a ring-like member including means defining a passage for receiving at least a portion of a finger therein, said ring-like member including a portion adapted to bear against the front of said finger extending forwardly of said means defining a passage for receiving at least a portion of a finger therein; and

tab engaging means for engaging said tab, said tab engaging means being associated with said forwardly extending portion of said ring-like member and being rigidly interconnected with the portion of said ring-like member adapted to bear against the front of said finger and projecting outwardly therefrom, said tab engaging means including a tab receiving passage extending along an axis sustantially parallel to, and spaced from, the longitudinal axis of the portion of said finger received within said ring-like member.

4,919,017

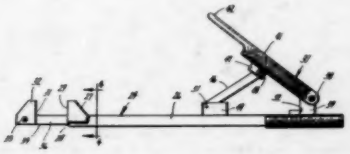
HOSE CLAMP TOOL

William E. Thomas, 5048 Genesee Rd., Lapeer, Mich. 48446

Filed Jan. 27, 1989, Ser. No. 303,500

Int. Cl.[5] B25B 27/20

U.S. Cl. 81—9.3 **17 Claims**



1. A hose clamp tool to overcome the resilient force of a resilient, circular hose clamp and force the lugs at the arcuate ends of the clamp toward each other to increase the diameter of the clamp enough to allow the clamp to move along an elastomeric hose, the tool comprising:

first and second elongated members, the first elongated member comprising a rigid tube having first and second ends;

a first jaw joined to the first end of the tube and comprising a pressure surface facing away from the second end, the

second elongated member extending along the tube and being guided by it to slide longitudinally along it and having a first end extending beyond the first end of the tube and a second end in the vicinity of the second end of the tube;

a second jaw joined to the first end of the second elongated member and comprising a pressure surface facing the pressure surface of the first jaw;

an axle on one of the elongated members remote from the first end of that member;

a handle pivotally mounted on the axle to pivot relative to the elongated member on which it is mounted and having a free end that moves arcuately relative to that member and extends toward the first end thereof; and

a link having a first end pivotally attached to the handle to pivot about a first axis located between the axle and the free end of the handle and having a second end pivotally attached to the other elongated member to pivot about a second axis fixedly located relative to the latter elongated member, whereby moving the handle in one direction moves the pressure surfaces of the jaws toward each other to grasp the lugs of a hose clamp and move them toward each other to increase the diameter of the hose clamp, and moving the handle in the opposite direction moves the pressure surfaces apart to release the hose clamp lugs.

4,919,018

HYDRAULIC POWER WRENCH

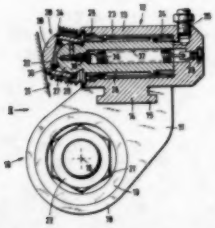
Karl Beuke, Neunkirchen-Seelscheid, Fed. Rep. of Germany, assignor to Paul-Heinz Wagner, Fed. Rep. of Germany

Filed Jan. 11, 1989, Ser. No. 295,868

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1988, 8800773[U]; Mar. 10, 1988, 3807924; Apr. 8, 1988, 3811776

Int. Cl.[5] B25B *13/46*

U.S. Cl. 81—57.39 **17 Claims**



1. An hydraulic power wrench having a cylinder unit (12) and a wrench head (10) connected to a casing (13) of said cylinder unit (12), said wrench head (10) having an axis (16) of rotation and being connectable with a screw (22) to be turned for a rotational pulling of said screw, a piston rod (26) slidably disposed within said casing (13) of the cylinder unit (12) and having a pressure means for supporting contact against a stationary abutment (31), a guiding track formed in the casing in slidable engagement with a guiding track formed in the wrench head, said guiding tracks are is disposed generally parallel to the axis of the wrench head (10) such that the casing is displaceable relative to the wrench head along said axis.

4,919,019

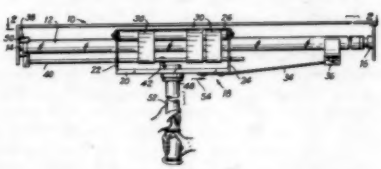
DEVICE FOR THE REMOVAL OR INSTALLATION OF FLUORESCENT TUBES OF THE SINGLE-PIN TYPE

Henry M. Unger, Weston, and Michael Vorobyov, Bethel, both of Conn., assignors to Unger Licencing Ltd., N.Y.

Filed Jun. 7, 1989, Ser. No. 362,710

Int. Cl.[5] B25B *3/00*

U.S. Cl. 81—53.12 **3 Claims**



1. A device for use in the removal and installation of single-pin type fluorescent tubes in lighting fixtures, including:

a cradle adapted to be positioned around a said tube intermediate the ends of said tube;

first means carried by said cradle for resiliently securing a said tube within said cradle against axial displacement relative thereto;

second means carried by said cradle and supported for axial movement in a direction parallel to a said tube, said second means having engagement means for engagement with an end wall of a lighting fixture;

third means carried by said cradle and operative to move said second means to an axially extended position; and,

fourth means carried by said cradle for operating said third means from a position remote from said cradle;

whereby, operation of said third means is operative to move a said tube and said cradle in a direction axially of said tube and oppositely to the direction of movement of said second means upon engagement of said second means with a said end wall of a said lighting fixture;

in which said cradle has axially spaced end walls, and said second means includes a rod supported in said end walls for axial sliding movement in said end walls, an abutment member carried by said rod at a position intermediate said end walls, and means reacting between said abutment member and an adjacent end wall of said cradle and resiliently biasing said rod into a retracted first position;

said third means includes an eccentric cam supported for rotation about a longitudinal axis of said cam, said cam engaging said abutment member and being operative to cam said second means against said bias and into an extended second position; and

said fourth means includes a stub-shaft journalled for rotation in said cradle and to which said eccentric cam is attached, and, means for attaching said stub-shaft to an extension pole, whereby said cradle and a fluorescent tube supported within said cradle can be manually manipulated, and, whereby rotation of said pole will result in operation of said second means from said first position to said second position resulting from rotation of said eccentric cam.

4,919,020

SPRING-LOADED MAGNETIC DRIVER AND METHOD OF ASSEMBLY THEREOF

David A. Huebschen, Kenosha, Wis., assignor to Snap-on Tools Corporation, Kenosha, Wis.

Filed Jun. 23, 1989, Ser. No. 370,848

Int. Cl.[5] B25B *13/02*

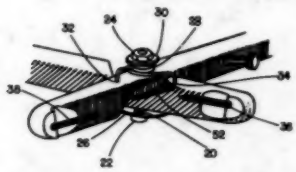
U.S. Cl. 81—125 **14 Claims**

1. In a driving tool including a hollow tubular shank and a socket coupled to the shank at one end thereof and communicating therewith for receiving an associated rotatable fastening member, the improvement comprising: a body of adhesive

material disposed in the shank and spaced from the one end thereof, a compression spring disposed in the shank and having one end thereof embedded in said body of adhesive material for fixedly mounting said spring in the shank, and magnet means

coupled to said spring at the other end thereof, said spring in its normal uncompressed condition projecting from said body of adhesive material a distance such that said magnet means is disposed for magnetic engagement with an associated fastening member received in the socket.

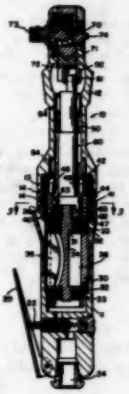
4,919,021
PLIERS FOR CLOSING A LOCKING RING
Joseph K. Franks, Rosman, N.C., assignor to Jensen Engineering, Asheville, N.C.
Filed Nov. 10, 1986, Ser. No. 929,009
Int. Cl.[5] B25B 7/02
U.S. Cl. 81—426.5 **10 Claims**



1. Pliers comprising;
first and second handles; said handles each having a jaw element; each jaw element having a free end; means for pivoting said handles in a plane of rotation for moving said free ends; means for urging said jaw elements away from one another in a direction normal to said plane of rotation of said handles; said means for urging including an incline plane on each of said jaw elements; a groove in each jaw; said grooves substantially facing one another; said incline planes contacting one another as said free ends of said jaw elements are moved toward one another thereby moving said grooves in a direction normal to the plane of rotation of said handles.

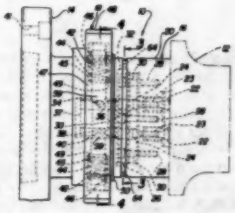
4,919,022
RATCHET WRENCH
Akira Ono, Saitama, and Toshiro Iritani, Sagamihara, both of Japan, assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.
Continuation of Ser. No. 188,143, Apr. 29, 1988, abandoned, which is a continuation of Ser. No. 861,540, May 9, 1986, abandoned. This application Jun. 5, 1989, Ser. No. 363,419
Int. Cl.[5] B25B 19/00
U.S. Cl. 81—464 **6 Claims**

1. A powered ratchet wrench comprising, in axial alignment to form an elongated handle:
a rotary motor having a rotatable output shaft;
a rotary impact clutch mechanism also having a rotatable output shaft and rotated by
said rotatable output shaft of said rotary motor;
a reversible ratchet mechanism having an oscillatable ratchet yoke and being oscillatably driven through said yoke by the output shaft of said impact clutch; and



a single ended tool drive spindle driven by said ratchet mechanism and having its drive axis normal to the axes of said rotary motor and said impact clutch.

4,919,023
QUICK-CHANGE TOOL ADAPTER
Harry W. Bloink, 16880 Kinloch, Redford, Mich. 48240
Filed Mar. 22, 1988, Ser. No. 171,546
Int. Cl.[5] B23B 29/20
U.S. Cl. 82—160 **10 Claims**



1. A quick-change adapter for affixing and precisely locating a working member such as a tool, a workpiece or the like upon a machining device, comprising:
a first holder having a first surface including a first engagement portion:
a second holder having a second surface including a second engagement portion and a portion defining an aperture through said second surface;
a first means for affixing one of said working member and said machining device to said first holder;
second means for affixing the other of said machining device and said working member to said second holder;
a shank on said first holder extending from said first surface and dimensioned to be received in said aperture in said second surface; and
means connected to said second holder for drawing on said shank so as to bring said first and second engagement portions into firm abutment against one another;
wherein said first and second engagement portions are configured as helical face gears;
wherein said shank includes an end opposite said first holder

and a ramp surface tapering radially inwardly in the direction of an axis of said shank from said end and towards said first holder; and wherein said drawing means comprises at least three pins disposed on said second holder around said aperture and movable therein, each of said pins being abuttable against said ramp surface of said shank; and

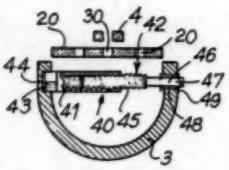
wherein said drawing means further comprises means on said second holder for biasing said pins away from said ramp surface of said shank, and a radially floating cam ring carried by said second holder disposed around said pins and said aperture, said cam ring including a cam surface against which said biasing means biases said pins; said second holder including a first facing portion facing towards said cam ring and said cam ring including a second facing portion opposite said first facing portion and radially spaced from said first facing portion, whereby rotation of said cam ring about said second holder causes said pins to abut said ramp surface of said shank while said cam ring is free to move radially with respect to said second holder during such rotation.

4,919,024

HARP MADE FROM COMPOSITE MATERIAL

Didier Budin, 30, Avenue de la Grande Armee, 75017 Paris, France

Filed Jul. 29, 1988, Ser. No. 226,367
Claims priority, application France, Jul. 31, 1987, 87 10900
Int. Cl.[5] G10D *1/04*
U.S. Cl. 84—265 **10 Claims**



1. A harp formed of a plurality of constituent parts comprising a base, a body having a lower sill connected to said base and an upper sill, a neck having a pier on one end thereof connected to said upper sill of said body and another end connected to an upper cone on one end of a pillar, a soundboard having a bridge molded thereon fitted on said body wherein said soundboard has a lower sill connected to said base and said soundboard and bridge are pierced by a plurality of sound holes, said neck and pier being formed of one piece and said body and its upper sill and lower sill being formed of one piece, said pillar having another end provided with a lower cone connected to said lower sill of said soundboard wherein the body has a pair of lateral walls fitted internally with at least one sound adjustable spacer disposed between said lateral walls of said body.

4,919,025

METHOD AND APPARATUS FOR PROCESSING CONTINUOUSLY MANUFACTURED TUBING

George K. Snyder, Lockport, N.Y., assignor to General Motors Corporation, Detroit, Mich.

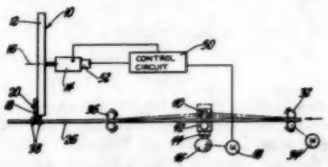
Filed Oct. 24, 1988, Ser. No. 261,306
Int. Cl.[5] B26D *3/16*
U.S. Cl. 83—54 **6 Claims**

1. In a process for the continuous manufacture of straight tubes of predetermined precise length from straight resilient tube stock, the method of momentarily stopping the tube stock at a cutting station comprising the steps of:

guiding the tube stock through a normally straight travel path to the cutting station,

periodically momentarily increasing a predetermined length of the travel path so as to stretch a portion of the tube stock in advance of the cutting station,

controlling the rate of the path length increase and thereby the amount of tube stock stretch to momentarily stop the advance of the tube stock at the cutting station while



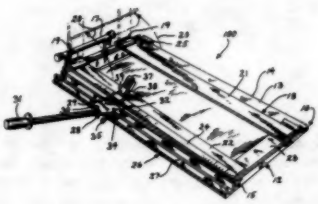
feeding of the tube stock along the travel path continues, whereby only for the duration of the momentary stop is the travel path increased and resultantly a portion of the tube stock at the cutting station measured from the leading end and encompassing the prescribed length is essentially stationary to facilitate a precise cutting operation thereon.

4,919,026

APPARATUS FOR CUTTING FLEXIBLE MATERIALS

Gordon F. Julson, Jr., 2732 S. Burrell St., Milwaukee, Wis. 53207

Filed Sep. 13, 1988, Ser. No. 243,984
Int. Cl.[5] B26D *3/12*
U.S. Cl. 83—56 **25 Claims**



1. A method of cutting a web of flexible material, comprising the steps of:

securing a blade holder to a deck over which said web is to be directed;

disposing a thin, flat blade in said holder, said holder having a trans verse dimension exceeding the thickness dimension of said blade by an amount in the range of about 0.001 to 0.125 inches, such that said blade is substantially unconstrained within said holder;

inducing said blade to move with respect to said web in response to said web moving relative to said blade, such that said blade exhibits an up and down motion relative to said web, thereby sawing through said web.

4,919,027

SHEET DIVERTING AND DELIVERY SYSTEM

Francis J. Littleton, Alden, N.Y., assignor to Littleton Industrial Consultants, Inc., Alden, N.Y.

Filed Nov. 20, 1987, Ser. No. 123,548
Int. Cl.[5] B41F *13/60*; B65H *29/60, 29/68*
U.S. Cl. 83—107 **13 Claims**

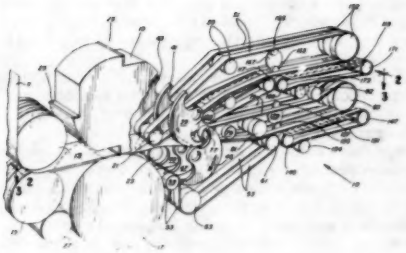
1. A sheet diverter and delivery system for receiving a fast moving, continuous web, cutting sheets therefrom and diverting alternate sheets to one of two delivery paths for subsequent processing, all while maintaining substantially continuous control of the individual sheets, comprising:

first conveyor means including cutting means for cutting a fast moving continuous web into a stream of separate sheets and directing the sheets along an original travel path at an original speed;

sheet controlling means disposed downstream of said first conveying means and along the original travel path of said first conveying means to securely engage the lead edge of the web before it is cut;

second conveyor means and third conveyor means each having an entrance end and an exit end and each including at least a pair of closely spaced face to face belts, said entrance ends being positioned downstream of said sheet controlling means, said second conveyor means disposed above said third conveyor means, said second and third conveyor means being driven at a speed at least approximately the original speed of the sheets and being positioned on alternate sides of the original travel path and diverging from the original travel path at approximately the same angle;

a pair of rotating diverter means positioned in close proximity to the entrance ends of said second and third conveyor



means for alternately diverting the separate sheets from the original travel path into said second and third conveyor means without the use of a stationary diverter or guide member, each of the diverter means being synchronized with the speed of the one of the second and third conveyor means with which the diverter means is associated to engage the leading edge of the sheet to be diverted at a sufficiently small angle and directly divert the leading edge of the sheet under substantially continuous control into the grasp and control of the associated conveyor means before the trailing edge of the sheet is disengaged from said sheet controlling means so as to avoid damage and misalignment of the sheet, the diverter means thereafter continuing to support substantially the entire length of the sheet as the sheet is taken up by the associated conveyor means and ultimately released by said sheet controlling means; and

means connected with each of said second and third conveyor means for decelerating and shingling said sheets for delivering two separate streams of shingled sheets to a subsequent processing station.

4,919,028

SHEARING MACHINE

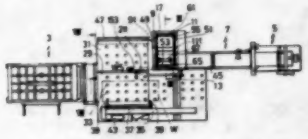
Chuo Tobita, Isehara, and Eiji Matsuno, Atsugi, both of Japan, assignors to Amada Company, Limited, Isehara, Japan

Continuation of Ser. No. 941,579, Dec. 15, 1986, abandoned, which is a continuation of Ser. No. 729,330, May 1, 1985, abandoned. This application Jul. 29, 1988, Ser. No. 227,411

Claims priority, application Japan, May 2, 1984, 59-64398; May 11, 1984, 59-67727; May 11, 1984, 59-67729; Apr. 22, 1985, 60-58884; Apr. 22, 1985, 60-58882

Int. Cl.[5] B26D *7/18*

U.S. Cl. 83—153 **22 Claims**



15. A shearing machine comprising upper and lower blades for shearing a sheet-like workpiece, workpiece clamping and positioning means movable along the X and Y axes to feed and position a workpiece on a fixed work-table, a swingable work-table connected to said fixed work-table to remove scraps and a scrap carrying means for carrying scraps from said workpiece clamping and positioning means onto said swingable work-table, said scrap carrying means further including a lower fixed jaw means, an upper movable jaw means, and a spring means to keep said upper movable jaw means downwardly biased over said fixed jaw means for carrying said scraps;

said carrying means is movable along a first guide means and is so arranged as to grip and release the scraps near the ends of the first guide means, the scraps being gripped and released near the ends of the first guide means by cam means; and

said first guide means and the said cam means are held by a holding means which are movable up and down to enable said carrying means to project out of and lower from the top surface of the fixed and swingable work-tables.

4,919,029

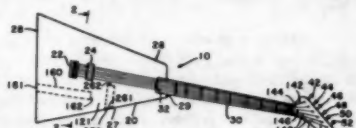
ASYMMETRIC INSERT LOADED STRINGED INSTRUMENT

Richard Excellente, 19 Marc Dr., Howell, N.J. 07731

Filed Jan. 10, 1989, Ser. No. 295,441

Int. Cl.[5] G10D *1/08*

U.S. Cl. 84—291 **16 Claims**



1. In a stringed instrument comprising a solid body having a front surface and a rear surface, peripheral edges connecting said front and rear surfaces, a neck extending from one end of said body, and strings tensioned on the body over a bridge and a neck in a substantially common plane, the improvement comprising:

a rigid mass of density greater than that of said body at least partially embedded in said body in such a manner that at least 50% of the peripheral surface area of said rigid mass

is in contact with said body and in such a manner that the resultant mass of the side of said body proximal to the strings of highest frequency is greater than that on the other side distal to said strings of highest frequency to provide asymmetric weight loading of at least 10% of the weight of the instrument prior to said embedding.

4,919,030

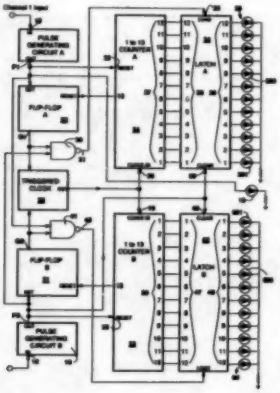
VISUAL INDICATOR OF TEMPORAL ACCURACY OF COMPARED PERCUSSIVE TRANSIENT SIGNALS

Marius R. Perron, III, 2815 Swandale, San Antonio, Tex. 78230

Filed Oct. 10, 1989, Ser. No. 418,654

Int. Cl.[5] G09B *15/00*

U.S. Cl. 84—470 R **3 Claims**



1. A visual indicator of temporal accuracy of compared percussive transient signals comprising:

means for receiving a reference percussive transient input signal;

means for receiving a performance percussive transient input signal;

means for determining whether said reference input signal receiving means or said performance input signal receiving means first received a first percussive transient input signal and for further determining the time difference between when said first percussive transient input signal is received and when a second percussive transient input signal is received by either said reference input signal means receiver or said performance input signal means receiver, whichever did not first receive said first percussive transient input signal; and

means for visually displaying whether said reference percussive transient input signal or said performance percussive transient input signal was first received and said time difference of reception of said first percussive transient input signal and said second percussive transient input signal.

4,919,031

ELECTRONIC STRINGED INSTRUMENT OF THE TYPE FOR CONTROLLING MUSICAL TONES IN RESPONSE TO STRING VIBRATION

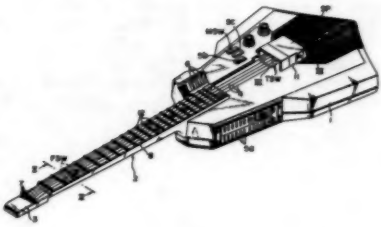
Naoaki Matsumoto, Tachikawa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Mar. 21, 1988, Ser. No. 171,883

Claims priority, application Japan, Mar. 24, 1987, 62-67919; Mar. 24, 1987, 62-67920; Mar. 30, 1987, 62-77257; Mar. 30, 1987, 62-47616[U]; Mar. 30, 1987, 62-47617[U]; Mar. 30, 1987, 62-47618[U]; Mar. 30, 1987, 62-47619[U]; May 27, 1987, 62-80659[U]; May 27, 1987, 62-80660[U]

Int. Cl.[5] G10H *7/00, 5/00, 1/02, 1/46*

U.S. Cl. 84—601 **16 Claims**



1. An electronic stringed instrument comprising:

string triggering data output means for detecting vibration of at least one string stretched on an instrument main body and for outputting string triggering data corresponding to said vibration;

pitch designation data output means for detecting a pitch designation operation state of said string and for outputting pitch designation data corresponding to said pitch designation operation state;

sounding start instructing means for providing an instruction to start generating a musical tone with a pitch designated by said pitch designation data from said pitch designation data output means in response to said string triggering data from said string triggering data output means; and

sound-stop start instructing means for providing a sound-stop start instruction to stop generating said musical tone upon elapse of a predetermined time period from a point of time at which generation of said musical tone was started in accordance with an instruction from the sounding start instructing means.

4,919,032

ELECTRONIC INSTRUMENT WITH A PITCH DATA DELAY FUNCTION

Shigeo Sakashita, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Dec. 20, 1988, Ser. No. 287,405

Claims priority, application Japan, Dec. 28, 1987, 62-200157[U]; Aug. 19, 1988, 63-108343[U]; Aug. 19, 1988, 63-204818

Int. Cl.[5] G10H *1/18, 1/42, 5/00*

U.S. Cl. 84—653 **11 Claims**

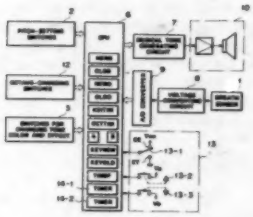
1. An electronic musical instrument, comprising:

a plurality of pitch designation means for designating a pitch of a musical tone to be generated according to combined pitch-setting operations by a player;

air flow sensor means for detecting an air flow state induced by a player and for producing a corresponding air flow sensing signal;

tone generation instructing means for instructing generation of a musical tone at a pitch set by said plurality of pitch designation means based on said air flow sense signal produced by said air flow sensor means;

change timing detection means responsive to a change in a combined pitch-setting operation of said plurality of pitch designation means, for detecting a timing of said change; and



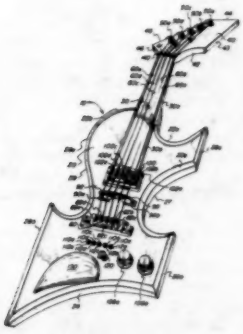
tone control means responsive to said change timing detection means detecting a change in said combined pitch-setting operation, for controlling generation of a musical tone at a new pitch newly set by said change in said combined pitch-setting operation, upon elapse of a predetermined time from said detected timing of said change.

4,919,033

ELECTRIC VIOLIN

Alexander Markov, Rowayton, Conn., and James Remington, Jamaica Estates, N.Y., assignors to Alexander Markov, Rowayton, Conn.

Filed Jan. 4, 1989, Ser. No. 293,313
Int. Cl.[5] G10H *3/18*
U.S. Cl. 84—726 **20 Claims**



1. An electric violin comprising:

(a) a body having an upper end, a first side having upper and lower portions, a lower end and a second side having upper and lower portions, said body shaped so as to comprise a fingerboard indentation along said upper end in a location on one side of a fingerboard extending therefrom, said fingerboard indentation providing sufficient space to permit fingering over a major portion of a fingerboard; a first bow indentation along said first side sized to permit greater space for movement of a bow; and a second bow indentation along said second side sized to permit greater space for movement of a bow;

(b) an unfretted fingerboard having an upper portion and a lower portion, said lower portion mounted on said body and said upper portion extending from said upper end of said body, said fingerboard having sufficient width to accommodate a plurality of strings;

(c) a head disposed on the end of said upper portion of said fingerboard, said head comprising a plurality of pegs, each corresponding to a string;

(d) a plurality of strings, each removably attached to said body, extending along said fingerboard and removably attached to each of said pegs on said head; and

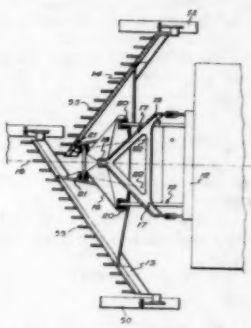
(e) a magnetic pickup connectively associated with said body and having an upper portion mounted on said body so as to be operatively connected with each of said plurality of strings to receive sounds therefrom and a lower portion mounted in said body capable of providing the sounds to a suitable amplification means.

4,919,034

MINE CLEARING APPARATUS

Charles B. Firth, Aston Works, Bramley, Leeds LS13 2BY, England

Filed Jun. 13, 1989, Ser. No. 365,534
Int. Cl.[5] F41H *11/12*
U.S. Cl. 89—1.13 **10 Claims**



1. Mine clearing apparatus for mounting on a vehicle, said apparatus comprising

a support, adapted, in use, to be supported on a vehicle,

first and second elongate plough blades,

means mounting said blades pivotally on said support such that each of said blades, in use, extends generally transversely of the path of travel of said vehicle in forward and rearward spaced relation to each other along said path of vehicle travel, said forward blade overlapping said path of vehicle travel, and said rearward blade terminating close to said path of vehicle travel and overlapping said forward blade,

said blade pivotal mounting means including means permitting pivotal movement of each blade about a first axis extending transversely to said path of vehicle travel and a second axis substantially perpendicular to said first axis and parallel to said path of vehicle travel.

4,919,035

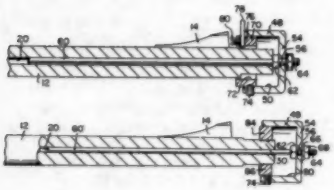
MUZZLE BRAKE AND TOOL FOR INSTALLATION

Mark C. Pinkston, and Margarita Pinkston, both of P.O. Box 635, Kailua, Hi. 96734-0635

Filed Mar. 6, 1989, Ser. No. 319,321
Int. Cl.[5] F41C *21/18*; B23B *5/00, 3/02*
U.S. Cl. 89—14.3 **6 Claims**

4. A tool for forming an external thread on the muzzle end of a gun barrel comprising a handle assembly including laterally extending handles, a pilot rod mounted centrally of the handle assembly and freely slidably and rotatably received in the gun barrel for orienting and guiding the handle assembly during rotational and axial movement thereof, said handle assembly including centrally located mounting means thereon,

a cutter assembly mounted on said mounting means, releasable securing means removably retaining the cutter assembly on the mounting means to enable removal of the cutter assembly and a threading die assembly mounted on the mounting means subsequent to the cutter assembly to form external threads on the muzzle end of the barrel when the handle assembly is



rotated and moved axially toward the muzzle end of the barrel, said cutter assembly including a holder mounted on the mounting means and including a radially extending cutter element adjustably mounted on the holder and means securing the cutter element in radially adjusted position to engage the exterior of the muzzle end of the barrel.

4,919,036

ARRESTING APPARATUS FOR FIXATION OF AN ADJUSTED POSITION

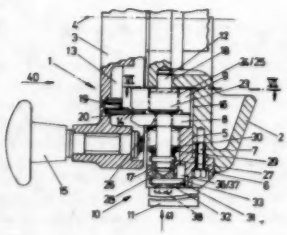
Peter Eng, Regensdorf, Switzerland, assignor to Contraves AG, Zürich, Switzerland

Filed Nov. 7, 1988, Ser. No. 267,832

Claims priority, application Switzerland, Nov. 10, 1987, 04369/87

Int. Cl.[5] F41D *11/06*

U.S. Cl. 89—37.11 **11 Claims**



1. A locking apparatus for securing an adjusted position at a device, comprising:

housing means provided for said device;

an adjustment mechanism having an axis of rotation;

said adjustment mechanism comprising a substantially cylindrical-shaped ring member arranged substantially concentrically with respect to the axis of rotation of the adjustment mechanism;

a clamping device cooperating with said substantially cylindrical-shaped ring member;

said clamping device comprising a pair of clamping jaw members;

said clamping jaw member being capable of assuming a clamping position, in which said substantially cylindrical-shaped ring member is clamped between the pair of clamping jaw members, and a released position, in which said substantially cylindrical-shaped ring member is released from both clamping jaw members of said pair of clamping jaw members;

said clamping device containing a displaceable member which is axially displaceable relative to and in said housing means and radially displaceable with respect to said substantially cylindrical-shaped ring member;

said displaceable member containing a coupling shaft section for coupling said displaceable member via a threaded bore in a clamping jaw member of said pair of clamping jaw members to said pair of clamping jaw members for displacing both said clamping jaw members of said pair of clamping jaw members in a self-positioning manner between said clamping position and said released position relative to said substantially cylindrical-shaped ring member; and

actuation means for displacing said displaceable member axially relative to and in said housing means and radially with respect to said substantially cylindrical-shaped ring member.

4,919,037

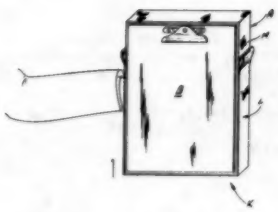
CLIPBOARD BALLISTIC SHIELD

Hal D. Mitchell, Rolla, Mo., assignor to American Protective Equipment, Inc., St. Louis, Mo.

Filed Mar. 1, 1988, Ser. No. 162,486

Int. Cl.[5] F41H *5/08*

U.S. Cl. 89—36.05 **7 Claims**



1. The combination of a clipboard and a ballistic package having a first bullet strike face, a second face and four sides, two of said sides being opposing, comprising:

hook and loop fastener means attaching said clipboard to the first face of said ballistic package;

a handling device located on the second face of said ballistic package, and handling device comprising a wrist strap and circular pocket to accept either the right or left hand of a person handling said combination clipboard and ballistic package,

said ballistic package including a fabric layer of woven nylon impregnated with urethane and a layer of ionomer foam; and

deployable strap means attached to said two opposing sides of said four sides, said deploying strap means fitting snugly at least three of said four sides when not deployed and being deployable into first position to engage the neck and a second position to engage the shoulder of a person using said combination clipboard and ballistic device.

4,919,038

ARMOURED CAR

Gert Kausträter, Augsburg, and Norbert Müller, Friedberg, both of Fed. Rep. of Germany, assignors to Kuka Wehrtechnik GmbH, Augsburg, Fed. Rep. of Germany

Filed Jul. 6, 1988, Ser. No. 215,540

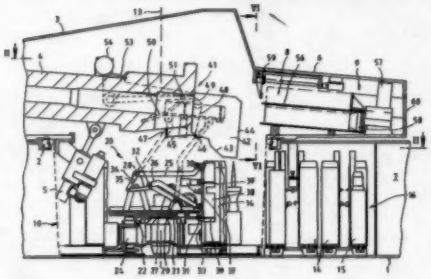
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1987, 3722353

Int. Cl.[5] F41F *9/06*; F41H *7/02*

U.S. Cl. 89—46 **33 Claims**

1. Armoured car with a rotatable turret, a weapon mounted in the turret, a magazine housed in the armoured car and receiving large calibre ammunition in an upright position in an arrangement concentric to a rotational axis of the turret, and a

loader having a loading arm engaging with the ammunition in the magazine and raising the same into a loading position aligned with a bore axis of the weapon, wherein the loader is arranged on a rotatable ring mount positioned below a weapon breach block on a turret platform, said ring mount having an



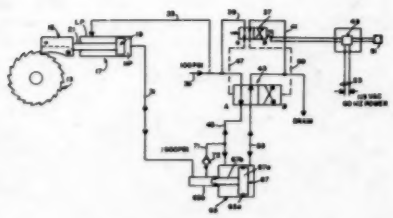
axis of rotation coincidental with the rotational axis of the turret, and wherein a multilever guide means is supported on the ring mount and is movable in a vertical plane for raising the loading arm of the loader with the upright ammunition along a steep movement path and only pivots the loading arm into the loading position towards and end of the steep movement path.

4,919,039

HYDRAULIC TURNING GEAR

Norman E. Nutter, Lunenburg, Mass., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 25, 1988, Ser. No. 223,850
Int. Cl.[5] F15B *21/02*
U.S. Cl. 91—40 **14 Claims**



1. A hydraulic turning gear for imparting rotational movement to a rotor comprising:

a ratchet wheel for attachment to the rotor;

a pawl mechanism for engaging the ratchet wheel;

a hydraulic cylinder connected to the pawl mechanism causing the pawl mechanism to reciprocate whereby the linear movement of the pawl mechanism causes the ratchet wheel to rotate;

a source of relatively low pressure hydraulic fluid for driving the hydraulic cylinder;

a booster cylinder for raising the pressure of the relatively low pressure fluid to a higher pressure sufficient to drive the hydraulic cylinder; the booster cylinder being connected to the hydraulic cylinder; and,

valve means for directing the relatively low pressure hydraulic fluid to drive the booster cylinder, and

wherein the hydraulic cylinder includes an arm which extends externally from the hydraulic cylinder and the pawl mechanism includes a clevis whish is mounted to the hydraulic cylinder arm and a pawl which is pivotally attached to the clevis, and

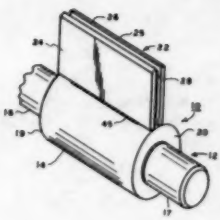
further wherein the pawl is pivotally attached to the clevis by means of a pin extending through both the pawl and the clevis, and further including means on said pin for imparting an adjustable frictional force between the pawl and the clevis whereby the pawl, once pivoted, needs a reset force to return to its original position for engaging the ratchet wheel.

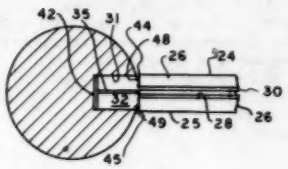
4,919,040

ROTOR VANE AND SHAFT ASSEMBLY

Phillip A. Sollami, 1300 E. Pine, Herrin, Ill. 62948

Filed Dec. 12, 1988, Ser. No. 283,505
Int. Cl.[5] F01C *9/00*
U.S. Cl. 92—125 **5 Claims**





1. A rotor, comprising in combination

a shaft having a longitudinally elongate radial cavity therein,

a vane having oppositely disposed planar faces and a peripheral groove disposed in the edges of said vane between said faces for receiving an elastomeric sealing member,

said vane including an integral tongue depending into said cavity with said vane extending in a radial direction from said shaft with the central longitudinal axis of said shaft lying in the plane of said vane,

said tongue including a plurality of ribs tightly fitted against said shaft at the ends of said cavity, and

an imperforate bonding material filling the space between said tongue and the surfaces of said shaft defining said cavity to bond said vane to said shaft and to prevent the passage of fluid between said tongue and shaft.

4,919,041

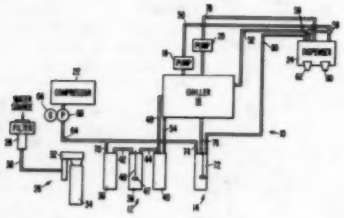
BREWING AND DISPENSING SYSTEM AND METHOD FOR ICED TEA

Harold F. Miller, 107 Winston Way, Goose Creek, S.C. 29445

Filed Dec. 22, 1988, Ser. No. 288,573
Int. Cl.[5] A47J *31/00*
U.S. Cl. 99—279 **16 Claims**

1. A brewing and dispensing system for presweetened iced tea including brewing means for brewing a supply of tea from fresh tea leaves, a supply of sweetener specifically formulated to remain in a liquid state when the sweetener is in a chilled condition, chiller means fluidically connected to the tea supply and the sweetener supply for maintaining the tea and the sweetener in a chilled condition, circulating means for maintaining the tea and the sweetener under constant circulation

while the tea and the sweetener are in said chilled condition, dispenser means fluidically connected to said chiller means for dispensing a preselected ratio of sweetener and tea, and compressor means for propelling tea from the tea supply and sweet-



ener from the sweetener, supply to the chiller means, tea and sweetener from said chiller means to said dispenser means, and undispensed tea and sweetener from said dispenser means to each respective supply

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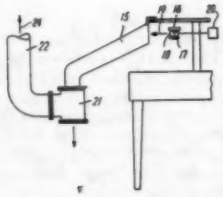
4,919,042

APPARATUS FOR THE BREAKING OF EGGS AND THEIR SEPARATION INTO YOLK AND ALBUMEN

Hans Kristian L. Rasmussen, Morud, Denmark, assignor to Sanovo Engineering A/S, Odense, Denmark

Filed Dec. 20, 1988, Ser. No. 286,729
Claims priority, application Denmark, Oct. 4, 1988, 5534/88
Int. Cl.[5] A23J *1/09*; A47J *43/14*
U.S. Cl. 99—499 **4 Claims**



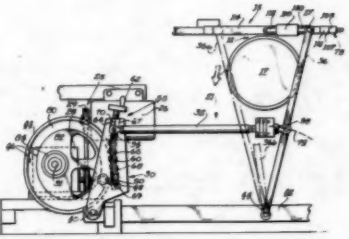
1. An apparatus for breaking eggs and separating yolk and albumen, comprising a supply conveyor, a washing and flushing system for washing eggs on the conveyor, an egg breaking mechanism at one end of the conveyor having a plurality of egg stations, each said egg station having means for receiving and holding one egg at a time, breaking the egg shell and separating yolk and albumen, means for successively passing the egg stations by the conveyor to receive eggs and continue through a closed path, and a working station along the closed path for control of the separation of yolk and albumen, separate collection of yolk and albumen and removal of empty shell fractions, wherein the working station comprises pressurized air supply means for blowing off the shell fractions from the holding means of the egg stations and a scavenging duct for receiving blown-off shell fractions, the improvement comprising the scavenging duct of the working station having an inlet end positioned near the holding means of the egg stations passing by and an outlet end, and an air sluice having one end communicating with means for providing air suction, said air sluice having another end connected to the outlet end of the scavenging duct.

4,919,043

WEB TECH DRIVE ASSEMBLY FOR STENCIL CARRIAGE

Henry J. Bubley, and Phil Motev, both of Deerfield, Ill., assignors to American Screen Printing Company, Chicago, Ill.

Filed Oct. 4, 1988, Ser. No. 253,006
Int. Cl.[5] B05C *17/04*
U.S. Cl. 101—123 **10 Claims**



1. In a screen printing press, the combination comprising:
a screen printing press means including a movable screen printing carriage;
a lever means connected to the screen printing carriage to reciprocate the same through a stroke of a given length;
a cam means having a predetermined profiled cam surface and a cam follower for following the cam surface and connected to the lever means to actuate the lever means to reciprocate the screen printing carriage;
adjustable stroke means in said lever means for adjusting the stroke of the lever means from said given length of stroke thereby changing the length of travel of the screen printing carriage, the cam surface providing a non-symmetrical displacement with time for the lever means and for the screen printing carriage to allow greater than fifty percent of the time of travel in one direction to be used to decelerate the screen printing carriage.

4,919,044

SIMULATED WATERMARK PRINTING SYSTEM

Robert E. Lafler, Charlton City, Mass., assignor to Westvaco Corporation, New York, N.Y.

Division of Ser. No. 93,104, Aug. 21, 1987, Pat. No. 4,824,486, and a continuation-in-part of Ser. No. 794,391, Nov. 4, 1985, abandoned. This application Dec. 5, 1988, Ser. No. 279,856
Int. Cl.[5] B41F *9/00*; C09D *11/00*
U.S. Cl. 101—141 **8 Claims**

1. A method of simulating watermarked paper comprising the steps of printing a selected watermark indicia upon an uncoated paper sheet with a flexographic press having a fountain roll and an anilox roll using a solution of approximately 50% solids having a refractive index of between 1.50 and 1.54 and 50% solvent having a boiling point in excess of 290° F. wherein said solids constituent of said solution comprises about 70% to 90% soluble, oxidation resistant resin that is the hydrogenated ester of rosin having a refractive index of about 1.50 and about 10% to 30% plasticizer.

4,919,045

OFFSET PRINTER HAVING A PRESS DRUM LARGER THAN ITS RUBBER DRUM

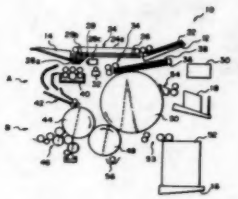
Toshimitsu Okubo, Shibata; Kazuyoshi Kobayashi, Marata; Kohki Ohmura, Shibata; Yoshinobu Sai, Watari; Takuo Satoh; Yukihiko Yoshino, both of Shibata; Nobuyuki Hoshi, Sendai; Takayuki Onodera, Shibata; Yasuo Endoh, Shiroishi; Sigenobu Irokawa, Sendai, and Toshiaki Sannohe, Watari, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 14, 1988, Ser. No. 257,941

Claims priority, application Japan, Oct. 14, 1987, 62-156027

Int. Cl.[5] B41F 7/06; B41C 1/10

U.S. Cl. 101—142 11 Claims



1. An offset printer comprising:

(a) a plate making section for reading the image of documents, performing predetermined image processing, and forming images resulting from the image processing on sheet material to produce plates;

(b) a plate drum disposed beneath said plate making section;

(c) first means for feeding plates from said plate making section to said plate drum and for wrapping the plates around said plate drum;

(d) second means for supplying ink and water to the plates while they are wrapped around said plate drum;

(e) a rubber drum disposed obliquely below and in operative association with said plate drum, said rubber drum having a first diameter;

(f) a press drum:

(i) disposed obliquely above and at a predetermined angle relative to said rubber drum;

(ii) in operative association with said rubber drum at a nipping section;

(iii) disposed between said rubber drum and said plate making section; and

(iv) having a second diameter that is an integral multiple equal to or greater than two of said first diameter;

(g) third means for feeding sheets of paper to said nipping section of said press drum; and

(h) fourth means on said press drum for gripping sheets of paper at the nipping section, wrapping them around said press drum, and releasing them at a position located far enough away from said nipping section around the periphery of said press drum such that the trailing edge of each sheet of paper wrapped around said press drum has passed said nipping section before the leading edge is released by the fourth means from the press drum.

4,919,046

OFFSET PRINTING APPARATUS OPERATING IN TANDEM

Nicolas Kakko-Chiloff, Montrouge, France, assignor to Usinage Montage et Assistance Technique "U.M.A.T." , Loiret and Conseil Vente Service, Seine Saint Denis, both of, France

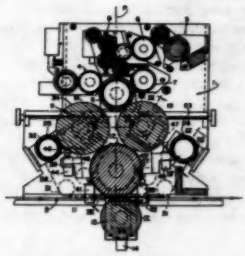
Filed Dec. 16, 1988, Ser. No. 285,161

Claims priority, application France, Dec. 18, 1987, 87 17752

Int. Cl.[5] B41F 7/08, 13/32

U.S. Cl. 101—143 7 Claims

1. An offset printing apparatus operating in tandem including a frame having an upper portion on which are mounted an inking device and a moistening device for respectively applying a film of ink and a film of moistening liquid on a touching cylinder having a horizontal axis and rotatively mounted on the frame and having a lower portion on which are rotatively and tangently mounted a blanket cylinder and counter-cylinder, with a web to be printed passing therebetween, and having axes which extend horizontally and transversely and therefore perpendicularly to the web to be printed, the axis of the blanket cylinder and the axis of the touching cylinder being placed in a same vertical plane, and wherein it further includes two plate cylinders having horizontal and transverse axes placed respectively on either side of a vertical plane passing through the axes of the touching cylinder and blanket cylinder, a support mounted at a level intermediate between the touching cylinder and blanket cylinder, said support being provided for the two plate cylinders and being tiltably mounted about the axis of the blanket cylinder, two starting cylinders having horizontal and



transverse axes disposed respectively slightly below and outside with respect to each of the two plate cylinders, and control means for controlling a tilting motion of the support of the two plate cylinders for setting under pressure each of said two plate cylinders and for rotatively driving the starting cylinders in order to bring alternatively each of the two plate cylinders either in a printing position in which the plate cylinder is in contact under pressure both with the upper touching cylinder and with the lower blanket cylinder after having previously started the plate cylinder in rotation at a same peripheral speed as that of the blanket cylinder and having keyed the plate cylinder in an angular position, or in a stopped waiting position in which the pate cylinder is retracted from the touching cylinder and blanket cylinder and is bearing against a corresponding starting cylinder for enabling changing of a printing plate thereof.

4,919,047

MULTICOLOR PRINTING PRESS

Yoshinori Inouye, Ohtsu; Minoru Ueda, Koga, and Kosuke Yotsuzuka, Ohtsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Aug. 27, 1986, Ser. No. 900,794

Claims priority, application Japan, Aug. 27, 1985, 60-189096; Aug. 30, 1985, 60-192498

Int. Cl.[5] B41F 5/02, 7/08, 31/30

U.S. Cl. 101—175 19 Claims

1. A multicolor printing press executing printing operations with waterless printing plates, said multicolor printing press comprising:

a printing press body;

a plurality of plate cylinders being set to predetermined positions of said printing press body;

a plurality of inking devices each commonly being compatible with each plate cylinder and installed to said printing press body so that each of said inking devices can individually and freely be mounted onto and removed from said printing press body; and

a plurality of plate feeding and discharging devices each

commonly being compatible with each of said plate cylinders and means for installing said plate feeding and discharging devices to said printing press body so that each said plate feeding and discharging device can individually and freely be mounted onto and removed from said printing press body

wherein each said inking device includes:

a frame;

a form roller mounted on said frame;

an ink distributing roller mounted to said frame; and

a roller operating mechanism mounted to said frame for pressing said ink distributing roller against said form roller;

driving means being provided at said printing press body for driving said roller operating mechanism;

said ink distributing roller being pressed against said form roller by engaging said driving means with said roller operating mechanism in conjunction with mounting said inking device onto said printing press body, wherein

said roller operating mechanism includes:

a driving lever connected pivotally to said frame of said inking device; and

a linkage connected between said driving lever and a roller shaft of said ink distributing roller enabling said ink distributing roller to be pressed against and released from said form roller in conjunction with movement of said driving lever;

said driving means comprising a spring mounted to said printing press body,

said spring causing said driving lever to pivot from a raised position by mounting said inking device onto said printing press body.

4,919,048

APPARATUS FOR PREVENTING CONTACT OF WET INK SHEETS WITH PRINTING PRESS DELIVERY MECHANISM AND FOR DRYING SAID WET INK

Jack D. Tyler, 3017 Morton, Fort Worth, Tex. 76107

Continuation-in-part of Ser. No. 891,955, Aug. 1, 1986, Pat. No. 4,722,276. This application Jan. 19, 1988, Ser. No. 145,286

The portion of the term of this patent subsequent to Feb. 2, 2005, has been disclaimed.

Int. Cl.[5] B41F *21/08, 5/22;* B41L *21/10*

U.S. Cl. 101—217 **8 Claims**

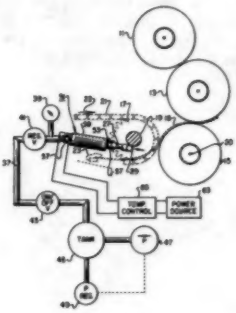
1. In a printing press having an impression cylinder and a blanket cylinder, a chain delivery means for withdrawing sheets from between the cylinders including a shaft and a pair of sprockets located adjacent the cylinders carrying a chain with an upper run leading toward the cylinders and a lower run leading away from the cylinders, the shaft carrying the sprockets, and gripping means carried by the chain for engaging leading edges of the sheets to carry them away from the cylinders, an improved means for preventing the sheets from contacting the shaft while the ink is still wet, comprising in combination:

a reservoir tank;

an air compressor for supplying pressurized air to said reservoir tank;

a pressure regulator for controlling said air compressor to maintain a constant pressure in said reservoir tank;

a conduit leading from the reservoir tank to a point adjacent the shaft;



an electrical heating element located in the conduit for heating the pressurized air to a selected temperature; and

the conduit having a nozzle mounted adjacent the shaft and the nozzle having a tip with a plurality of openings spaced horizontally apart from each other for discharging jets of heated air against the sheets to push them away from the shaft and to dry the wet ink carried by the sheets.

4,919,049

WEB FEED PRINTING PRESS

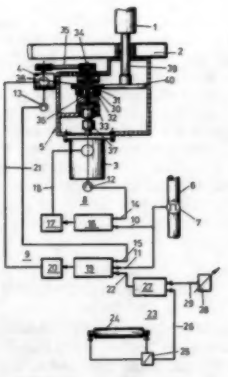
Arnold Niedermaier, Beindersheim, and Anton Weis, Lorsch, both of Fed. Rep. of Germany, assignors to Albert-Frankenthal AG, Frankenthal, Fed. Rep. of Germany

Filed Mar. 20, 1989, Ser. No. 325,566

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1988, 3812295

Int. Cl.[5] B41F *13/54*

U.S. Cl. 101—228 **7 Claims**



1. A web feed printing press comprising a longitudinal shaft for driving at least one printing unit and with a device for driving at least one web draw roll, wherein the drive means associated with each draw roll comprises a main motor and an auxiliary motor with means for regulating the speed of the two

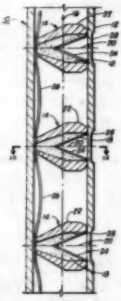
motors and a differential drive with two inputs and an output, the speed of rotation of the main motor being able to be varied in accordance with the speed of rotation of the longitudinal shaft and the speed of rotation of the auxiliary motor being able to be varied in accordance with the speed of the longitudinal shaft and of the tension of the web to be printed and the auxiliary motor is connected with a differential element of the differential drive by means of which element a speed difference between, on the one hand, the rotation of the input of the differential drive connected with the main motor and, on the other hand, the output, connected with the draw roll, of the differential may be produced.

4,919,050

WELL PERFORATING DEVICE

John W. Dobrinski, Rt. 5 Box 125, Weatherford, Okla. 73096, and Thomas L. Elliston, 1401 Westover La., Ft. Worth, Tex. 76107

Filed Dec. 14, 1988, Ser. No. 284,190
Int. Cl.[5] F42B *1/02*
U.S. Cl. 102—307 **7 Claims**



1. In a well perforating device comprising a body member having a plurality of hole penetration areas of reduced thickness formed in an outer surface thereof, and a plurality of hole guns positioned within the body member, each of the hole guns containing a hollow cone shaped explosive charge aligned with one of the hole penetration areas so that upon detonation of the hollow cone shaped explosive charge the body member is penetrated through the aligned hole penetration area, the improvement comprising:

a plurality of inwardly tapered wall expansion zones formed in the body member so as to circumferentially extend around the body member and encompasses the hole penetration areas, each of the wall expansion zones having a wall thickness greater than the hole penetration area such that upon detonation of the hollow cone shaped charges of the hole gun the wall expansion zones are expanded to substantially correspond to the outside diameter of the body member.

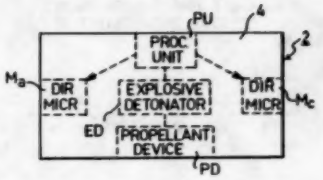
4,919,051

PROXIMITY DETECTOR MINE SYSTEM

David Cohen, D. N. Emek Ayalon, Moshav Ben Nun, Israel

Filed May 26, 1989, Ser. No. 357,936
Claims priority, application Israel, May 27, 1988, 86525
Int. Cl.[5] F42B *23/04*; F42C *13/06*
U.S. Cl. 102—404 **18 Claims**

1. A proximity detector mine system, comprising: a mine deployable on the ground and including a porpellant device effective upon actuation to propel the mine above the ground, explosive material, a detonator for detonating the explosive material a predetermined time after the propellant has been actuated, sound sensing means producing electrical signals in response to the sound sensed thereby, and a processor for processisng said electrical signals and for actuating the propellant device in response to the electrical signals received from



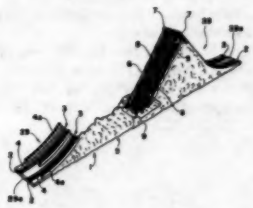
the sound sensing means; said sound sensing means comprising a plurality of directional microphones oriented in different directions.

4,919,052

TRACK APPARATUS FOR A TOY RACING CAR

Yousuke Yoneda, and Masami Furukawa, both of Tokyo, Japan, assignors to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Jan. 10, 1989, Ser. No. 295,398
Claims priority, application Japan, Dec. 23, 1988, 63-16680[U]
Int. Cl.[5] A63G *7/00, 11/00*
U.S. Cl. 104—54 **23 Claims**



12. A track apparatus for a toy racing car comprising:

a track support body having a car-entry track portion at one end and a car-exit track portion at the opposite end; and

pivotal means disposed between the car-entry and car-exit track portions, and including:

first and second pivotal arms pivotally movable independently of each other between a first position juxtaposed the car-entry track portion and a second position juxtaposed the car-exit track portion, each pivotal arm being pivotally movable between the first and second positions by impulse imparted by a toy racing car corresponding travelling on each pivotal arm, means for stopping the car from moving on the pivotal means and for releasing the car when the pivotal arm associated with the car reaches the second position, each pivotal arm having a distal end and a proximal end pivotally connected to the track support body;

first and second stands connected respectively to the first and second pivotal arms;

means associated with each stand for transferring the momentum of a corresponding car to the first and second pivotal arms to thereby cause pivotal movement of each from the first to the second position; and

means for returning the first and second pivotal arms to the first position after pivotal movement to the second position.

4,919,053

CONVEYOR WITH TWIN BIAS ACCUMULATION

Miguel A. Redondo, Overland Park, Kans., assignor to Mid-West Conveyor Company, Inc., Kansas City, Kans.

Filed Aug. 1, 1989, Ser. No. 388,602
Int. Cl.[5] E01B 25/22; B61B 3/00
U.S. Cl. 104—91 **7 Claims**

1. In a conveyor system having a power and free power track with a first free track having a section aligned generally parallel to said power track for bias accumulation of carriers having lead and trailing trolleys along said power track wherein the lead trolleys of said carriers are located along said power track; the improvement comprising:

(a) a second free track located so as to have a section generally parallel to the power track opposite said first free track; and including

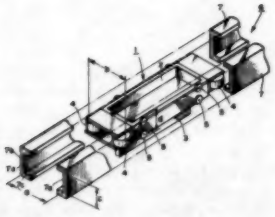
(b) switching means for switching the lead trolley of each of said carriers onto the power track while alternatively switching the trailing trolleys of said carriers to said first and second free tracks such that said carriers are twin biased banked along said power track with carriers being positioned alternatively on opposite sides of said power track.

4,919,054

CONVEYING APPARATUS

Yukito Matsuo, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 9,043, Jan. 27, 1987, abandoned, which is a continuation of Ser. No. 716,170, Mar. 26, 1985, abandoned. This application Sep. 28, 1988, Ser. No. 250,986
Claims priority, application Japan, Mar. 26, 1984, 59-58854
Int. Cl.[5] B61B 3/00
U.S. Cl. 104—94 **8 Claims**



1. A conveying apparatus comprising:

a carriage comprising a casing, having at the bottom a vertically depending reaction plate, adapted to carry an object therein;

driving means, located at predetermined positions outside said carriage for imparting a propelling force to the reaction plate, the propelling force being selectively transferable between an acceleration mode and a deceleration mode;

a guide rail means for guiding said carriage, said guide rail means comprising first and second guide members in parallel with each other, each guide member comprising a first guide surface for restricting movement of said carriage in a first direction corresponding to a lateral direction with respect to the travel of said carriage, wherein said first guide surface of said first guide member is directly opposite said first guide surface of said second guide member, and a pair of oppositely facing second guide surfaces for restricting the movement of said carriage in a second direction perpendicular to said first direction;

a first guide roller group comprising two pairs of first rollers, one pair being rotatably attached to a front end and the other pair being rotatably attached to a rear end of said carriage by shafts extending in said second direction, one of each pair of said first rollers contacting only said first guide surface of said first guide member and the other of each pair of said first rollers contactable only with said first guide surface of said second guide member so as to rotate in opposite directions when said carriage is propelled, thereby restricting movement of said carriage in said first direction; and

a second guide roller group comprising at least two pairs of second rollers rotatably attached to each side of said carriage by shafts extending in said first direction and spaced apart from each other in the direction of travel, each paired roller being disposed in a straight line in said second direction, one of each pair of said second rollers contacting a portion of one of said oppositely facing second guide surfaces and the other of each pair of said second rollers contactable with a portion of the other of said oppositely facing second guide surfaces, such that said contact portions are aligned with corresponding contactable portions forming a straight line parallel to said second direction, so as to rotate in opposite directions when said carriage is propelled thereby restricting movement of said carriage in said second direction,

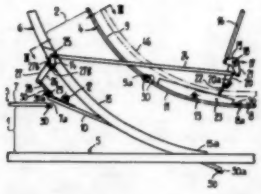
whereby said carriage is confined within said guide rail means and operable in three-dimensional travel such that said first and second rollers do not reverse their direction of rotation when said carriage is propelled in a given direction.

4,919,055

SWITCHING DEVICE FOR AN OVERHEAD CABLE TRANSPORT

Ferdinand Hora, Burgdorf, Switzerland, assignor to Von Roll Transportsysteme AG, Thun, Switzerland

Continuation of Ser. No. 142,684, Jan. 11, 1988, abandoned. This application Apr. 26, 1989, Ser. No. 342,682
Claims priority, application Switzerland, Jan. 20, 1987, 00196/87-9
Int. Cl.[5] E01B 25/26
U.S. Cl. 104—130 **28 Claims**



1. A switching device for a station track system of an overhead cable transport installation containing vehicles having carriage wheels, said vehicles being of the type in which each has to one side of its said carriage wheel load suspension means including an arm extending axially of said wheel and having a guide wheel on the end of that arm, said switching device comprising:

a primary track at which travel the vehicles;

a branch track at which travel the vehicles and which branches off from said primary track;

said primary track being provided with at least one travel rail for the carriage wheels of the vehicles;

said branch track being provided with at least one travel rail for the carriage wheel of the vehicles;

said travel rails of both said primary track and said branch track comprising three stationary track sections terminating in spaced relationship from one another;

each said primary track and branch track being provided with a respective movable track section;

each said movable track section being movable between an operative travel position and an operative rest position;

a different selected two of said three stationary track sections being operatively interconnected with one another in the travel positions respectively by different ones of said movable sections;

switching means for conjointly moving both of said movable track sections to disrupt one of said tracks and to complete the other by switching both of said movable sections when either is in said operative travel position and the other is in said inoperative rest position respectively to said inoperative rest position and said operative travel position; and

respective guide rails for and spaced from said travel rails to receive said guide wheel, the space between the said respective guide and travel rails being open along their length to accommodate said suspension means as a said vehicle travels on either of said travel rails and is guided by the respective guide rail.

4,919,056

SHELF CONVEYING SYSTEM

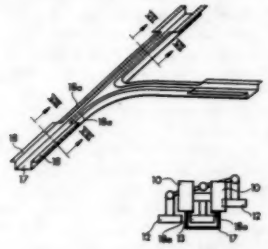
Christian J. Gronau, Bergisch Gladbach, Fed. Rep. of Germany, assignor to Koettgen GmbH & Co. KG, Bergisch Gladbach, Fed. Rep. of Germany

Filed Jun. 29, 1988, Ser. No. 212,908

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1987, 3722135

Int. Cl.[5] E01B *25/12*

U.S. Cl. 104—130 **4 Claims**



1. A shelf conveying system having a shelf conveying vehicle **(1)** guided within an upper track system and a ground track system having branch paths and driving bogies having track wheels engaging the rails of one of said track systems and equipped with guide rollers which laterally engage the track system and can be removed at the branches for running straight ahead or for the movement into branch paths of the track system, characterized by said ground track system **(7)** supporting the weight of said vehicle, said ground track system having a pair of rails arranged parallel to one another and providing a continuous support path without transition in the area of the branch paths **(15, 16)**; each of said rails having an upstanding leg and bearing surfaces extending laterally from the top of said legs, said bearing surfaces extending only laterally inward toward one another from said legs in the area of the branch paths and said bearing surfaces extending laterally outward in areas of the ground track system other than the areas of the branch paths; each of said driving bogies **(3)** having two wheels **(10)** in load bearing engagement with said bearing surfaces; each of said driving bogies **(3)** having at least one pilot roller **(13)** which extends into the space between said legs and said guide rollers being in confronting engageable relation to the laterally outer sides of said legs and being selectively movable upward out of engagement with said legs in the areas of said branch paths.

4,919,057

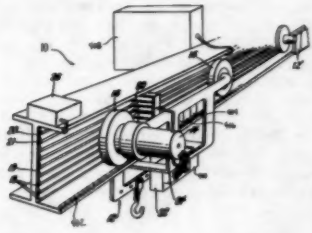
CONVEYOR CONTROL THROUGH BINARY CODING

Ron J. Riley, Grand Blanc, Mich., assignor to J. N. Fauver Comany, Inc., Madison Heights, Mich.

Continuation-in-part of Ser. No. 28,793, Mar. 23, 1987. This application Jul. 1, 1988, Ser. No. 214,331

Int. Cl.[5] B60L *15/00*; B61L *21/00*; B61B *13/16*; G06G *7/76*

U.S. Cl. 104—295 **54 Claims**



49. A conveyor control assembly including a vehicle **(12)** which moves along a track including conductive rail **(20)**, wherein the vehicle **(12)** transmits a digital signal to the rail **(20)** the digital signal comprising opposite polarity half-waves wherein each polarity represents a bit of binary coding, said assembly comprising; a vehicle **(12)** including wheels **(16)** for mobility, said vehicle including transmitting means for transmitting a digital signal on a rail **(20)**, said digital signal comprising a half-wave wherein the magnitude of said half-wave represents a bit of binary coding.

4,919,058

DOOR OPERATING MECHANISM FOR BUSINESS MACHINES

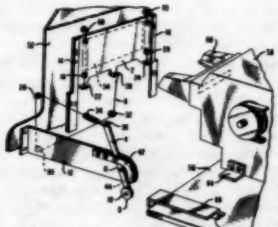
Hiromi Isozaki, Kanagawa, and Masakazu Ito, Hiratsuka, both of Japan, assignors to NCR Corporation, Dayton, Ohio

Filed Jun. 30, 1989, Ser. No. 374,382

Claims priority, application Japan, Sep. 16, 1988, 53-230158

Int. Cl.[5] G07G *5/00*; E06B *7/32*

U.S. Cl. 109—24.1 **12 Claims**



1. An apparatus comprising:

a mechanism having a projecting portion;

a housing having an aperture therein through which the projecting portion of said mechanism may extend;

a door for closing said aperture when said projecting portion of said mechanism is not extending therethrough;

a pair of parallel tracks located at opposite sides of said aperture for mounting said door for linear sliding movement parallel to the adjacent surface of said housing;

resilient means for urging said door to a closed position in which it covers said aperture;

operating means for moving said door from closed position to open position against the influence of said resilient means;

support means fixed to said housing;

lever means pivotally mounted on said support means and having one end coupled to said operating means;

follower means mounted on the other end of said lever means; and

engaging means fixed to said mechanism and engageable with said follower means as said mechanism is moved in a first direction to a position in which said projecting portion projects through said aperture, whereby movement of said mechanism in said first direction causes said engaging means to move said lever means to cause said operating means to move said door to open position, and whereby when said mechanism is moved in a second opposite direction so that said projecting portion is withdrawn from said aperture, said engaging means is moved out of engagement with said follower means to permit said resilient means to move said door into closed position.

4,919,059

PLANTING APPARATUS

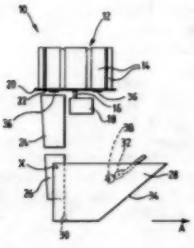
Anthony B. Windle, 'this L Do', Coneygarth Lane, Haxey, Doncaster, England (DN9 2JH)

Filed Sep. 9, 1988, Ser. No. 242,724

Claims priority, application United Kingdom, Sep. 10, 1987, 8721333

Int. Cl.[5] A01C *11/02*

U.S. Cl. 111—105 **10 Claims**



1. A planting apparatus for planting seedlings in a furrow, comprising a coulter for forming a furrow in the ground as the apparatus is towed, said coulter having a rear portion and a base portion, means for introducing a seedling into the coulter, including a rotatable carousel comprising a plurality of turrets, each said turret being adapted to receive a seedling, each said turret having a base and an openable flap at its base which allows the seedling to fall therefrom, a chute being located below said carousel such that when one of said turrets is directly above the chute the flap of said one turret automatically opens to allow the seedling to fall through said chute, a planting cup being situated below said chute substantially at the rear portion of said coulter so that the seedling comes to rest at the rear portion of the coulter, means for ejecting the seedling from the coulter into the furrow, and means for automatically delivering an intermittent jet of water to clean the apparatus and prevent the build-up of soil, said planting cup having a bottom portion and said means for ejecting the seedling from the coulter into the furrow including three wires extending from the bottom portion of the planting cup to the base of the coulter, which wires serve to push the seedling out of the coulter and also allow the passage of the jet of water.

4,919,060

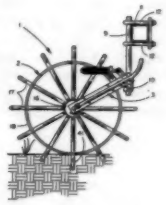
SPOKED WHEEL FERTILIZER INJECTOR

William F. Cady, Colo, Iowa, assignor to Cady Systems, Inc., Ankeny, Iowa

Filed Jan. 24, 1989, Ser. No. 301,899

Int. Cl.[5] A01C *23/02*

U.S. Cl. 111—128 **10 Claims**



1. An implement attachable to a movable means for injecting a fluid like substance below the surface of the ground, said implement comprising:

(a) a cylindrically shaped hub portion including:

(1) an axle having a closed end, an open end, an axially aligned first fluid passage extending from said open end at least half the length of said axle and a radially aligned second fluid passage extending from the first fluid passage to an outlet port on the circumference of said axle;

(2) a sleeve bearing extending a major portion between the ends of the hub surrounding said axle and said sleeve having at least one radially extending throughbore; and

(3) a cylindrically shaped housing having an axially aligned open center portion in which said bearing is located to serve as a support bearing for said housing and said housing having a number of radially aligned throughbores;

(b) support means for rotatably attaching said hub portion to said movable means;

(c) a number of hollow spokes each having a hollow center portion, one open end secured in one of the radial throughbores of said housing to extend radially outward therefrom and an opposite end with an outlet passage communicating with said hollow center portion;

(d) fluid supply means connected to the open end of said axle to provide fluid thereto that enters said axle fluid passages and is sequentially metered to said spokes through the throughbores of said sleeve and said housing; and

(e) said bearing is formed a self-lubricating fluoroplastic and the clearance between said axle and said bearing is not greater than 0.0030 inches.

4,919,061

BUTTON-HOLE SEWING MACHINE HAVING A THREAD CUTTING AND CLAMPING DEVICE

Gerhard Riss, Bielefeld, Fed. Rep. of Germany, assignor to Durkoppwerke GmbH, Fed. Rep. of Germany

Filed Apr. 12, 1989, Ser. No. 336,822

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1988, 3812092

Int. Cl.[5] D05B *65/02, 3/06*

U.S. Cl. 112—70 **11 Claims**

1. A button-hole sewing machine for sewing a button hole consisting essentially of generally parallel first and second button-hole caterpillar patterns, comprising:

an arm; an arm stand; and a base;

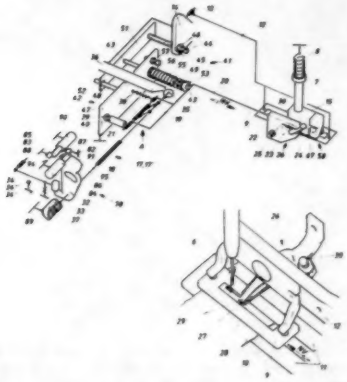
means for transporting a sewing-material workpiece in a

workpiece transport direction, across the base and toward the sewing needle;

a needle bar which reciprocates in a direction transverse to the workpiece transport direction and carries a sewing needle;

a material-presser basket; a presser block supported on said arm and operable to urge the basket toward said workpiece;

a thread cutting and clamping device; and



controlling means for controlling said thread cutting and clamping device, said controlling means being operable to cause the thread cutting and clamping device to move either parallel or transverse to said workpiece conveyance direction; and to catch the needle thread at the end of sewing an initial button hole, to cut said thread, and to hold it until releasing it during the sewing of a further button hole.

4,919,062

DATA PROCESSOR FOR USE IN SEWING MACHINE

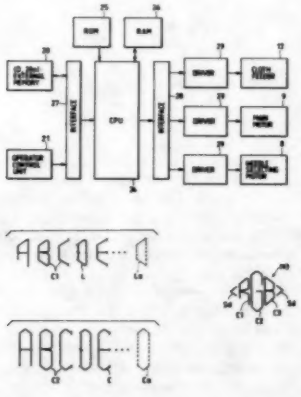
Masaaki Yokoe; Tomoe Takagi, both of Nagoya; Narihiro Matsushita, Kasugai, and Yuzo Takagi, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Sep. 20, 1989, Ser. No. 409,923

Claims priority, application Japan, Sep. 22, 1988, 63-237861

Int. Cl.[5] D05B *21/00*

U.S. Cl. 112—121.12 **9 Claims**



1. A data processor for processing input data to produce stitch pattern data used for sequentially stitching letters on materials with a sewing machine, comprising:

first memory means for storing stitch pattern data regarding stitch letters, the stitch letters being classified into a plurality of groups, each containing a set of letters having essentially the same outline profile different from that of the letters in another group, and for storing character identification codes identifying the stitch letters and their outer profiles;

input means for sequentially entering letters to be stitched and outputting letter codes indicative of the entered letters;

second memory means for storing preselected outer profiles of the stitch letters in relation to a stitching sequence in which the letters are to be stitched;

readout means for reading from said first memory means the stitch pattern data identified by the character identification codes in accordance with the letter codes outputted from said input means and the outer profiles stored in said second memory means; and

third memory means for storing the character identification codes read from said first memory means by said readout means.

4,919,063

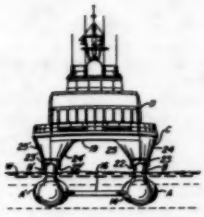
HULL CONSTRUCTION FOR A SWATH VESSEL

Nelson W. Hall, Poway, and Paul Kotzebue, San Diego, both of Calif., assignors to Swath Ocean Systems, Inc., Rancho Santa Fe, Calif.

Continuation-in-part of Ser. No. 174,286, Mar. 28, 1988, abandoned. This application Mar. 7, 1989, Ser. No. 318,263

Int. Cl.[5] B63B *1/10*

U.S. Cl. 114—56 **54 Claims**



1. In a SWATH type vessel of the type having at least two submerged parallel pontoons, at least one vertical strut extending upwardly from each pontoon cooperatively supporting above the water line a superstructure, the combination comprising:

the combined buoyancy of the two pontoons being such as to support the superstructure above the water line even while the vessel is at rest; and

at least one reserve buoyancy sponson supported by an associated strut and interposed between the underside of the superstructure and the top surface of a respective pontoon;

each sponson being vertically aligned above a respective pontoon and supported on its associated strut adjacent and above the water line while the vessel is at rest;

the said sponsons each having a relatively continuous narrow bottom surface extending substantially the length of its associated sponson and aligned with each other in substantially the same horizontal plane;

the said sponsons including said bottom surfaces thereof being shaped and configured to greatly increase the overall buoyancy of the vessel at a rapidly accelerated rate when, due to wave action, the lower extremities of the

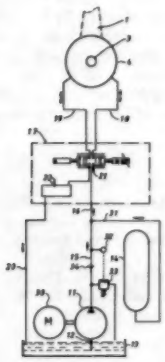
sponsons become increasingly immersed beneath the water line.

4,919,064

HYDRAULIC SYSTEM FOR SHIP RUDDER ROLL STABILIZATION AND STEERING

Heinz-Günter Ehluss, Tornesch; Erich Wessel, and Uwe Oldach, both of Hamburg, all of Fed. Rep. of Germany, assignors to Blohm & Voss AG, Hamburg, Fed. Rep. of Germany

Continuation of Ser. No. 624,045, Jun. 25, 1984, abandoned.
This application May 1, 1989, Ser. No. 348,178
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1983, 3322505
Int. Cl.[5] B63H *25/22*
U.S. Cl. 114—150 **8 Claims**



1. A hydraulic system for ship rudder roll stabilization and steering which comprises:

a hydraulically operated steering engine for controlling position of a rudder;

first supply means for delivering a hydraulic fluid to the steering engine, comprising a constant delivery pump and a pressure accumulator connected to the constant delivery pump and a valve gear for controlling period, direction and rate of flow of the hydraulic fluid to and from the steering engine,

and second supply means, for delivering a hydraulic fluid to the steering engine, comprising a steering pump and a slide valve for controlling period and direction of flow of the hydraulic fluid to and from the steering engine,

whereby said first and said second supply means are alternately to be utilized, and

whereby said first supply means are capable of effecting a rapid movement of the rudder over a restricted rudder angle and said second supply means are capable of effecting a movement of the rudder over the full rudder angle at a usual rudder rate.

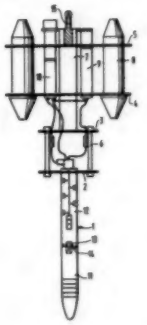
4,919,065

SUBMARINE VEHICLE INTENDED TO MEASURE DATA AT THE DEEP OCEAN SEA-BOTTOM

Charles N. Murray, Ispra, and Michel R. Jamet, Angera, both of Italy, assignors to European Atomic Energy Community (EURATOM), Luxembourg

Filed Feb. 3, 1989, Ser. No. 305,579
Claims priority, application Luxembourg, Feb. 3, 1988, 87126
Int. Cl.[5] E21B *15/02*
U.S. Cl. 114—312 **4 Claims**

1. A submarine vehicle intended to measure data at the deep ocean sea-bottom, comprising a penetrator conceived to penetrate by gravity into the sediments at the sea-bottom, a support structure having a vertical axis and a plurality of float clusters disposed regularly around the axis of the support structure at the upper portion thereof, the penetrator being mounted at the lower end of said support structure and coaxially therewith, the penetrator being conceived to be divided into two cylindrical parts by means of a remotely controlled discoupling means, the lower one of said parts having a rounded end portion intended to penetrate into the sea-bottom and to constitute a ballast such that the vehicle may descend by gravity and at a



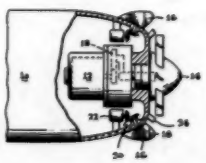
given speed to the sea-bottom, whereas the upper one of said penetrator parts is conceived to receive a device for measuring data in the sediment, a transmitter/receiver for ultrasound signals being mounted between the float clusters in the upper portion of the support structure and being conceived to cooperate with a similar transmitter/receiver at the free ocean surface, in order to transmit measuring data thereto and to receive control data therefrom, for example control data for discoupling the two parts of the penetrator.

4,919,066

HYDRODYNAMIC CONFIGURATION FOR UNDERWATER VEHICLE

Calvin A. Gongwer, Glendora, Calif., assignor to Allied-Signal, Inc., Morris Township, Morris County, N.J.

Filed Jan. 19, 1989, Ser. No. 298,703
Int. Cl.[5] B63G *8/08*
U.S. Cl. 114—338 **4 Claims**



1. A self-propelled vehicle for efficient, high speed movement through a fluid medium including a generally cylindrical housing, a propeller external of said housing, an energy source and power means in said housing connected to said energy source for driving said propeller, said propeller being to the rear of said vehicle, and a plurality of control fins located at the rear of said housing;

wherein the invention comprises forming said housing with a rounded bluff afterbody, forming said propeller of the actuator disc type and of approximately half to three-fourths of the diameter of said housing with a hub of substantial diameter adjacent said housing and tapering to the rear to assist in assuring attached flow over said housing, the spacing between the tips of the blades of said propeller and the nearest part of said afterbody being

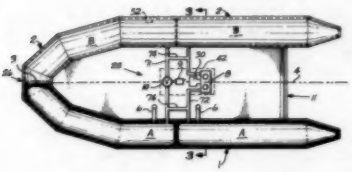
dimensioned such that substantially half or more of the boundary layer flow is inducted into said propeller, attaching a plurality of stator control surfaces to said afterbody between said fins and said propeller and placing said control fins just ahead of the rear surface of said housing at the shoulder of said afterbody such that they are located in an area where the free stream velocity of the surrounding fluid is essentially as high as or higher than free stream velocity.

4,919,067

SELF-RIGHTING MONOHULL VESSEL

Wayne B. Wenstob, and Kevin J. Wenstob, both of 836 Cormorant Street, Victoria, B.C., Canada (V8W 1R1)

Filed Feb. 9, 1988, Ser. No. 154,978
Claims priority, application Canada, Feb. 10, 1987, 529334
Int. Cl.[5] B64B *7/08*
U.S. Cl. 114—345 **13 Claims**



1. In an operatively water borne vessel whose center of gravity lies on an axis extending fore to aft thereof,

water-engaging hull-forming means defining a pair of first and second flotation chambers therewithin which are symmetrically arrayed about the aforesaid fore to aft axis of the vessel and extend on substantially parallel axes thereto in a generally horizontal plane when the vessel is disposed in the normal upright condition thereof on a body of ambient water,

said first and second flotation chambers having first and second means enclosed therewithin, respectively, for retaining gas under pressure,

means interconnected in a closed circuit with the respective first and second gas retention means. and operable to transfer gas retained in the first gas retention means to the second gas retention means, and vice versa,

the first gas retention means taking the form of a resiliently flexible gas-inflatable bag which is enclosed with the first flotation chamber to occupy alternately greater or lesser volume of the chamber, depending upon whether gas is added to or withdrawn from the bag, respectively,

means operable to control the operation of the gas transfer means in accordance with the angular orientation of the vessel about the fore to aft axis thereof,

said control means being responsive to the vessel capsizing in the body of ambient water to cause the gas transfer means to withdraw a portion of gas from the bag and add the portion to the second gas retention means,

liquid transfer means operable to open the first flotation chamber to the body of ambient water when the vessel has assumed the capsized condition thereof in the water, so that ambient water occupies that portion of the first flotation chamber evacuated by the bag when

the portion of gas is withdrawn therefrom, means closing the second flotation chamber to the body of ambient water when the portion of gas is added to the second gas retention means, so that the addition of water to the first flotation chamber shifts the center of gravity of the vessel further away from the axis of the second flotation chamber and induces the vessel to rotate about the same in the direction relatively downward from the aforesaid horizontal plane,

the control means being operable to cause the gas transfer means to return the aforesaid portion of gas to the bag in the first flotation chamber when the vessel has rotated downward about the axis of the second flotation chamber through an angle greater than 90° from the aforesaid horizontal plane, so that the water occupying the first flotation chamber is displaced from the same by the bag to induce the vessel to continue rotating about the axis of the second flotation chamber in the direction relatively upward toward the aforesaid horizontal plane, and to thereby return to the normal upright condition thereof, and

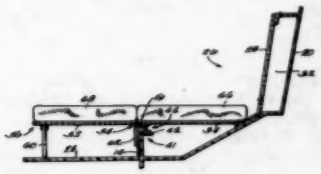
means operable to equalize the buoyancy of the respective first and second flotation chambers when the vessel has resumed the normal upright condition thereof.

4,919,068

RECREATIONAL BOAT SOFA/SLEEPER

Michael W. Lathers, Metamora, Mich., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Jul. 8, 1988, Ser. No. 216,791
Int. Cl.[5] B63B *17/00*
U.S. Cl. 114—363 **15 Claims**



9. A convertible sofa/sleeper comprising a seat bottom member which is movable between a horizontal position wherein said seat bottom member extends substantially horizontally and a canted position wherein said seat bottom member is inclined, and which includes a perimeter and an under surface fixed against movement with respect to said seat bottom member and located within said perimeter and adapted to removably engage a fixed supporting surface to locate said seat bottom member in said horizontal position, and a support member connected to said seat bottom member and movable between a seat supporting position wherein said support member is adapted to engage the fixed supporting surface so as to locate said seat bottom member in said canted position and a non-supporting position spaced from said seat supporting position and located wholly inwardly of said perimeter thereby facilitating engagement of said under surface with the fixed supporting surface.

4,919,069

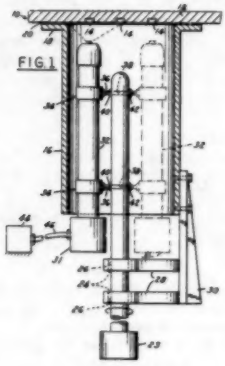
LOGO SPRAY APPARATUS

Alfred Brault, Berwick, Me., and Roberto Rosa-Miranda, Dover, N.H., assignors to Davidson Textron Inc., Dover, N.H.

Filed Sep. 16, 1988, Ser. No. 245,212
Int. Cl.[5] B05C *1/02*; B24C *41/08*
U.S. Cl. 118—308 **4 Claims**

1. A spray apparatus for depositing a layer of thermoplastic material onto a recessed surface of a logo plaque mold, said spray apparatus comprising a housing, seal means secured to an end of said housing, for sealing abutment against the mold surface, a rotatable shaft operatively connected to said housing so as to be rotatably mounted along the centerline thereof, a spray gun extension, and connector means for securing said spray gun extension to a side of said rotatable shaft for rotation

therewith such that the axis of the spray gun extension is parallel to the axis of the shaft for depositing the layer of thermo-



plastic material onto the mold surface in a circular path within said housing.

4,919,070

ELECTROSTATIC FLOCKING DEVICE

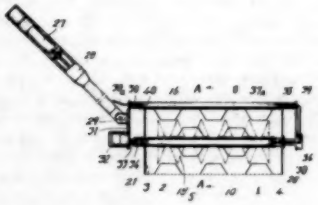
Satosobu Yoshikawa, c/o Mesac Co., Ltd. 12-1, Kabuto-cho, Nihonbashi, Chuo-ku, Tokyo, Japan

Filed May 23, 1989, Ser. No. 355,573

Claims priority, application Japan, Jul. 22, 1988, 63-97232

Int. Cl.[5] B05B *5/02*

U.S. Cl. 118—621 **1 Claim**



1. An electrostatic flocking device comprising a hollow handle member wherein high voltage static electricity generation means connected to a power source by a cable and a cord for drivingly connecting a second power source to a gear motor are disposed; bearing means rotatably attached to the base of said handle member and having a first support board on which said gear motor is mounted and a second support board on which a high voltage contact terminal embracing member is mounted, said first and second support boards being connected together by a plurality of circumferentially spaced and longitudinally extending support bars; a rotary horizontal casing journalled in said bearing means and having a perforated sheet extending about the periphery of said casing and end plates at the opposite ends of the casing, one of said end plates being detachable; a rotary shaft extending horizontally within said casing and having a first connector secured to one end of said shaft for connection with the rotary shaft of said gear motor by a second connector and having a rotary sleeve secured to the other end, said rotary sleeve having a high voltage contact terminal received therein; a high voltage contact terminal embracing member partially received in the opening at the outer end of said rotary sleeve and having a high voltage contact terminal therein; a plurality of partition walls extending longitudinally and radially from air rotary shaft to said perforated sheet to divide the interior of said casing into compartments and provided with notches; a plurality of conductive boards disposed between said partition walls and extending in the longitudinal direction of said rotary shaft within the casing; a plurality of triangular electrodes erecting from said conductive boards; a connector for detachably connecting between said rotary shaft within said casing and said rotary shaft of the gear motor; a high voltage cable for connecting between said high voltage static electricity generation means and said high voltage contact terminal within the high voltage contact terminal; and a synthetic resin cover covering a sector of said perforated sheet.

4,919,071

DRY TONER REMOVABLE DEVELOPING CARTRIDGE

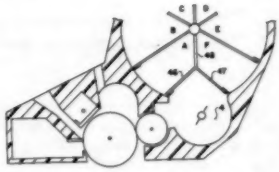
Giancarlo Gatti, Varese, Italy, assignor to Bull HN Information Systems Italia S.p.A., Caluso, Italy

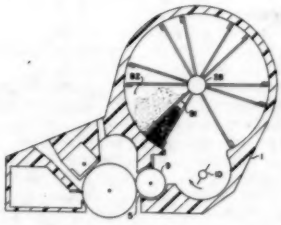
Filed Sep. 28, 1988, Ser. No. 250,475

Claims priority, application Italy, Nov. 5, 1987, 22525

Int. Cl.[5] G03G *15/08*

U.S. Cl. 118—653 **6 Claims**





1. Dry toner removable developing cartridge of the type comprising a donor sleeve, and a developing tank, further comprising:

a cylindrical housing located above said developing tank and communicating with it along a peripheral arc,

an axial shaft rotatably mounted in said housing, a plurality of diaphragms attached to said shaft and radially arranged in said housing around said shaft to form a plurality of compartments in form of cylindrical sectors,

at least one sealed opening for filling at least some of said compartments with developing material and

means to impart to said shaft and said diaphragms a rotation of predetermined angular increments so as to dispence in sequence the developing material contained in said compartments into said developing tank,

one of said radially arranged diaphragms forming a pair of wings which, for a predetermined angular position of said diaphragm, close the peripheral communication arc between said cylindrical housing and said development tank, so as to permit the filling of all said compartments through said opening, with developing material.

4,919,072

DEVICE FOR APPLYING A FLOWABLE COATING MASS

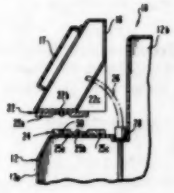
Henning J. Claasen, Lüneburg, Fed. Rep. of Germany, assignor to Nordson Corporation, Westlake, Ohio

Continuation of Ser. No. 938,299, Dec. 5, 1986, abandoned. This application Feb. 6, 1989, Ser. No. 307,224

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1985, 3543485

Int. Cl.[5] B05C 11/00

U.S. Cl. 118—666 11 Claims



1. A housing for a device for applying a flowable coating mass to a surface of a substrate, comprising:

a first housing for housing the hot-melt adhesive;

an electrical control means for controllably heating said hot-melt adhesive in said first housing;

a closed housing for accommodating said electrical control means, said closed housing being releasably mounted on said first housing, an air gap being formed between said first housing and said closed housing;

a rail-like means for releasably mounting said closed housing on said first housing and for reducing heat transfer between said first housing and said closed housing; and

an arrestable electric plug-like connection means for connecting said electrical control means to said first housing.

4,919,073

SURFACE TREATMENT METHOD AND APPARATUS THEREOF

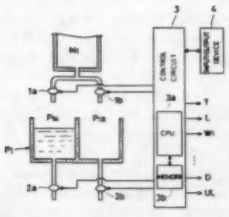
Atsuo Kobayashi, Hikone; Takuma Yamada, Moriyama, and Kiyoshi Akao, Hikone, all of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Division of Ser. No. 906,404, Sep. 9, 1986, Pat. No. 4,830,888. This application Feb. 28, 1989, Ser. No. 317,305

Claims priority, application Japan, Oct. 1, 1985, 60-219867

Int. Cl.[5] B05C 1/02

U.S. Cl. 118—688 5 Claims



1. A surface treatment apparatus of batch type for transporting an object to be treated along a treatment bath train including a predetermined number of treatment baths and for dipping said object in a treatment liquid supplied in said treatment baths in a predetermined order, thereby to execute a surface treatment of said object, comprising:

a treatment bath train comprising a plurality of treatment baths, in which a desired treatment bath is constructed as a multi-vessel treatment bath comprising a pair of unit treatment vessels each of which contains the same treatment liquid;

means for replacing the treatment liquid in one of said unit treatment vessels every time that predetermined conditions are satisfied in such a manner that at least one of said pair of unit treatment vessels at all times contains said treatment liquid for allowing said surface treatment of said object therein;

means for transporting said object along said treatment bath train to dip said object in the treatment liquid in only one of the pair of unit treatment vessel which is not being subjected to the replacement of treatment liquid; and

means for controlling a dipping time period in each unit treatment vessel of said multi-vessel treatment bath according to a predetermined characteristics of the treatment liquid therein.

4,919,074

APPARATUS FOR MOUNTING PARTS ONTO A PRINTED SUBSTRATE

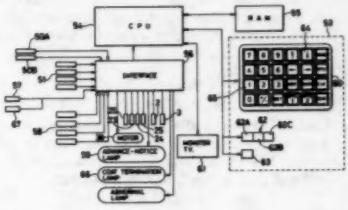
Toshiyuki Kurihara; Benso Aomoto, both of Osaka, and Ko Nishio, Oizumimachi, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Feb. 4, 1988, Ser. No. 152,344

Claims priority, application Japan, Feb. 9, 1987, 62-27607; Aug. 28, 1987, 62-215768

Int. Cl.[5] B05C 11/00

U.S. Cl. 118—697 18 Claims



1. An apparatus for coating adhesive for mounting parts onto a plurality of multiphase printed substrates comprising adhesive coating nozzle means arranged in correspondence to the plurality of multiphase printed substrates which are placed on an X-Y table means for effecting coating operations by coating an adhesive onto each of the printed substrates at areas on which the parts are to be mounted, timer means for counting unused time during which said coating nozzle means is unused, means for detecting an identification mark on a substrate plate of the multiphase printed substrates, means for inhibiting the coating operations by said coating nozzles in correspondence to the multiphase printed substrates when said detection means detects said mark, and control means for driving and controlling said coating nozzle means and said X-Y table in response to the passage of a predetermined time-up time counted by said timer means so as to deposit the adhesive onto the multiphase printed substrates at locations other than at said areas on which the parts are to be mounted.

4,919,075

ICE SLICER WITH SYRUP SUPPLY MECHANISM

Kobei Himi, Kuwana, Japan, assignor to Chubu Industries, Inc., Kuwana, Japan

Filed Jan. 25, 1989, Ser. No. 301,912

Claims priority, application Japan, Feb. 8, 1988, 63-15402

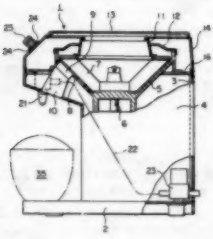
Int. Cl.[5] B05C 5/00

U.S. Cl. 118—699 2 Claims

1. An ice slicer with syrup supply mechanism comprising:

a frame mounted on a base;

a cutter case mounted to said frame and accommodating a rotor driven for rotation by a motor;
a cutting blade so mounted as to be exposed to a slit formed in said cutter case;
at least one downward syrup discharge nozzle provided at the front of said frame;
a connecting tube for connecting said discharge nozzle to a syrup container installed separately from said ice slicer;
an electromagnetic valve provided in said connecting tube; and



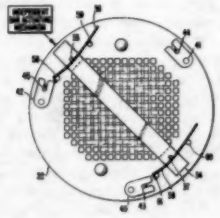
control means, provided inside said frame, for controlling said electromagnetic valve, said control means including first and second electrical switches connected in parallel with each other and connected to said electromagnetic valve, said first switch being a manual off on switch providing a variable discharge amount mode of operation and said second switch being controlled by a settable timer providing a constant discharge amount mode of operation.

4,919,076

REUSABLE EVAPORATION FIXTURE

David L. Lutz, Bealeton; Keith W. Meranda, and Russell B. Minter, both of Manassas, all of Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 3, 1988, Ser. No. 252,828
Int. Cl.[5] C23C *16/04*
U.S. Cl. 118—721 **15 Claims**



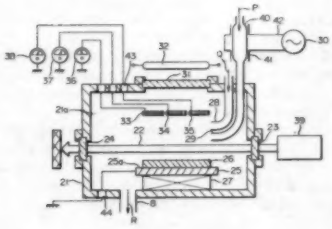
1. A reusable evaporation fixture for registering each of a plurality of individual substrates to respective sites of a plurality of contact mask sites of a single contact mask oriented in the X-Y plane comprising:
a base plate having a top face and a bottom face and having locating means mounted to said top face, for establishing a reference position in said X-Y plane;
said contact mask located over said top face of said base plate and engaged to said locating means;
a plurality of Z-spring means supported by said base plate to urge each of said plurality of individual substrates against said contact mask in the Z-direction;
a second plate over said top face of said base plate and said plurality of Z-spring means and below said contact mask, said second plate having a plurality of means to hold and align each of said plurality of individual substrates against respective X-Y alignment faces, each of said X-Y alignment faces corresponding to a respective site of said plurality of contact mask sites in said X-Y plane said second plate located between said base plate and said contact mask;
alignment means for aligning said second plate accurately to said contact mask;
a top plate supporting said contact mask in a configuration which allows deposition material to be deposited through the pattern of said contact mask.

4,919,077

SEMICONDUCTOR PRODUCING APPARATUS

Masao Oda; Toshiyuki Kobayashi, and Yoshimi Kinoshita, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

PCT No. PCT/JP87/01045, § 371 Date Aug. 23, 1988, § 102(e) Date Aug. 23, 1988
PCT Filed Dec. 26, 1987, Ser. No. 247,443
Claims priority, application Japan, Dec. 27, 1986, 61-314111; Apr. 15, 1987, 62-93521
Int. Cl.[5] C23C *16/50*
U.S. Cl. 118—723 **12 Claims**



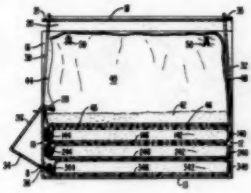
1. An apparatus for depositing a film on a surface of a substrate comprising:
a chamber;
holding means for holding a substrate disposed within said chamber;
means for heating a substrate disposed within said chamber;
a first port for introducing into said chamber a first gas including at least one of the elemental constituents of the film to be deposited;
plasma means for forming a plasma in a second gas flowing toward said chamber;
a second port for introducing into said chamber the flow of the second gas after passage through said plasma means;
first and second windows in said chamber for transmission of laser light and ultraviolet light, respectively, into said chamber;
a laser disposed outside said chamber for generating laser light transmitted into said chamber through said first window for decomposing the first gas near a substrate held by said holding means;
an ultraviolet light source disposed outside said chamber for generating ultraviolet light transmitted into said chamber through said second window for interacting with the first gas near a substrate held by said holding means;
a first electrode disposed in said chamber and electrically connected to a substrate held by said holding means;
a second electrode disposed in said chamber opposite said first electrode; and
a voltage source connected across said first and second electrodes for electrostatically urging ionized species in said chamber toward a substrate held by said holding means.

4,919,078

LITTER PACKAGING SYSTEM

Glenn E. Morrison, 1160 Francisco St., Berkeley, Calif. 94702

Filed Nov. 30, 1988, Ser. No. 277,970
Int. Cl.[5] A01K *1/01*
U.S. Cl. 119—1 **16 Claims**



1. Packaging apparatus for absorbant litter for an animal pet including:

a box having a substantially vertical front wall and having an unexpanded position;

a door in the front wall;

at least one removeable bag within the box for holding litter, the bag having a preformed bag opening; and

means for expanding the box into an expanded position and for expanding the bag to form a void within the bag of sufficient size to hold the pet, the preformed bag opening disposed within a substantially vertical plane adjacent to the door when the bag is expanded.

4,919,079

METHOD FOR TRANSPORTING LIVE FISH

Tadao Morishita, Minamatashi, Japan, assignor to Morishita Technical Laboratory, Kumamotoken, Japan

Filed Apr. 4, 1989, Ser. No. 332,962
Claims priority, application Japan, Dec. 14, 1988, 63-315330
Int. Cl.[5] A01K *61/00*
U.S. Cl. 119—3 **2 Claims**

1. A method for transporting live fish comprising grinding vegetable humus containing from 50 to 80% by weight of water, forming a ground powder contacting the said ground powder sufficiently with air to activate said ground powder, extracting the said activated powder with water and removing solid matter by filtering to obtain an extract, mixing the said activated powder or said extract in water of water-tank containing live fish and transporting said live fish containing tank.

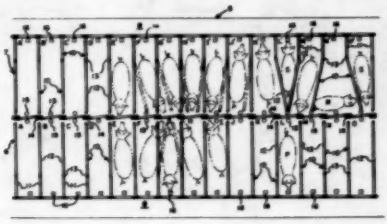
4,919,080

SYSTEM FOR CONCENTRATING ANIMALS IN INDIVIDUAL STALLS

Richard K. Balsbaugh, Quincy, Ill., assignor to Moorman Manufacturing Company, Quincy, Ill.

Filed Oct. 23, 1989, Ser. No. 425,742
Int. Cl.[5] A01K *1/02*
U.S. Cl. 119—20 **12 Claims**

1. A system for comfortably concentrating in individual stalls a group of elongated four-legged animals having as a group generally the same length and breadth comprising at least one row of elongated individual retention stalls arranged side-by-side and with each adjoining pair of stalls sharing a common vertical divider which comprises a fixed portion at one end to which a swingable portion is pivotally attached so as to be swingable from side-to-side, the width of each said stall when measured between adjacent ones of said fixed portions being sufficient to comfortably accommodate the breadths of said animals either standing or lying but insufficient to accommodate the lengths of said animals, and the length of each said stall being sufficient to comfortably lying, the swingable portions forming a widened space between adjacent ones of said swingable portions upon being forced apart by an enclosed



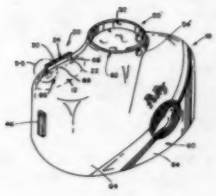
animal being sufficient to allow said animal to turn around in the stall.

4,919,081

GARMENT PROTECTOR

Jim A. Lewellen, 1017 S. McLean Dr., Santa Ana, Calif. 92704

Filed May 19, 1988, Ser. No. 195,860
Int. Cl.[5] A01K *31/12*
U.S. Cl. 119—26 **13 Claims**



1. A protective cover assembly for garments that supports a bird on a wearer's shoulder area comprising:

a first panel formed of fluid-proof material and adapted to cover the wearer's shoulder area;

a second panel formed of fluid-absorbent material and adapted in use to overlie said first panel;

a bird perching means insert securely attached to said first panel for supporting a bird on the wearer's shoulder, said bird perching means including a base means under and being secured to said first panel and being curved in shape to correspond to the curvature of the wearer's shoulder for providing a secure mount, said perching means further including a platform member upon which the bird sits, said platform member being connected to said base means to be positioned to overlie said second panel.

4,919,082

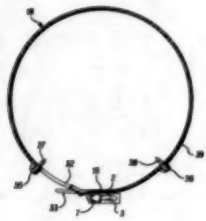
REMOTE CONTROL ANIMAL COLLAR

David M. Tsai, 124 Benedict La., Raleigh, N.C. 27614

Continuation-in-part of Ser. No. 230,957, Aug. 11, 1988. This application Nov. 22, 1988, Ser. No. 275,016
Int. Cl.[5] A01K *15/00, 27/00*
U.S. Cl. 119—29 **7 Claims**

7. An animal training collar comprising an elongated flexible strap adapted to encircle the neck of an animal and provided with means for applying pressure to the animal's neck on

receipt of a remotely provided signal, said pressure means being one or more electrically activated solenoids disposed in



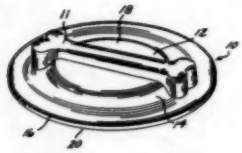
said collar and provided with piston rods which are radially displaced toward the animal's neck on receipt of said signal.

4,919,083

THROWABLE PET TOY

Herbert R. Axelrod, 211 W. Sylvania Ave., Neptune, N.J. 07753

Filed Jul. 11, 1988, Ser. No. 217,621
Int. Cl.[5] A01K *29/00*
U.S. Cl. 119—29 **4 Claims**



1. A flying pet toy adapted to be thrown by a human through the air for retrieval by an animal, said pet toy comprising:

a circular crown portion having a center, an intermediate circular surface portion surrounding said crown portion, and a circumferential rim portion surrounding the circular surface portion;

an animal attractant material impregnated in the material of the toy;

a radially extending upward projection formed across said crown and intermediate circular surface portions having vertically extending parallel side walls which terminate in a generally horizontally extending connecting surfaces that span the upper end of said side walls, said projection extending across the major portion of the pet toy at the mid-portion thereof, with said projection simulating a bone to provide a shape which can be readily grasped by the animal for retrieval and said projection also enhancing a gyroscopic effect of the pet toy.

4,919,084

POULTRY BROODER PILOT BURNER

Paul E. Maurice, 14 Fontaine St., Ludlow, Mass. 01056

Filed Sep. 16, 1987, Ser. No. 97,632
Int. Cl.[5] A01K *31/18*
U.S. Cl. 119—32 **36 Claims**

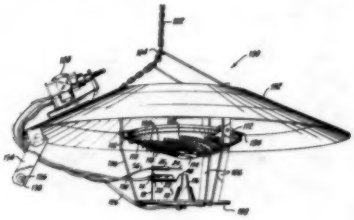
1. In a poultry brooder including a main gas burner, the improvement comprising a pilot burner having:

mounting plate means secured to said brooder;

orifice holder means for receiving and supporting an orifice, said orifice holder means being configured and dimensioned to be connected to a gas source;

a cylindrical pilot burner mounting stud attached to said mounting plate means, said mounting stud having an annular channel and being configured and dimensioned to engage and support said orifice holder means such that said orifice is exposed;

a pilot body removably attached to said mounting stud, said pilot body having at least one inwardly projecting mount-



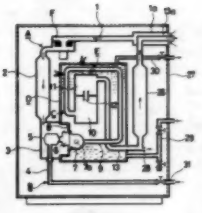
ing pin to engage said mounting stud annular channel, said removable pilot body being disposed over said orifice when attached to said mounting stud and extending horizontally adjacent to the main gas burner.

4,919,085

PULSE COMBUSTION APPARATUS

Katsusuke Ishiguro, Nagoya, Japan, assignor to Paloma Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Dec. 15, 1988, Ser. No. 285,112
Claims priority, application Japan, Jun. 4, 1988, 63-137962
Int. Cl.[5] F22B *31/00*
U.S. Cl. 122—24 **2 Claims**



1. A pulse combustion apparatus comprising

(a) a hot water storage tank,

(b) a combustion chamber provided in the tank,

(c) an air and fuel mixing chamber disposed outside the tank and connected to the combustion chamber,

(d) an air supply line having an air pipe, a fan, a first muffler and an air chamber which is connected to the mixing chamber, the first muffler being located between the fan and the air chamber,

(e) a fuel supply line connected to the mixing chamber,

(f) an exhaust line connected to the combustion chamber and having a greater part within the tank, the exhaust line including a second muffler which is located within the tank and comprises an expansion chamber and a noise damping chamber,

(g) a throat making the expansion chamber communicate with the noise damping, and

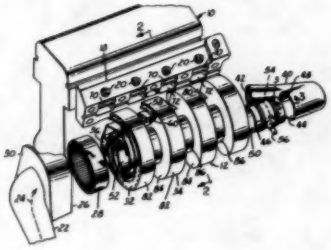
(h) a tailpipe connecting the combustion chamber to the expansion chamber.

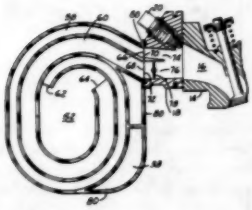
4,919,086

INTEGRATED TUNED INDUCTION SYSTEM

Ronald G. Shillington, Dover Center, Canada, assignor to Siemens-Bendix Automotive Electronics Ltd., Chatham, Canada

Filed Feb. 22, 1989, Ser. No. 313,921
Int. Cl.[5] F02M *35/10*
U.S. Cl. 123—52 MC **15 Claims**





1. An induction air circuit for a multi-cylinder internal combustion engine comprising an air intake leading to a first tube that runs parallel to the engine past a bank of cylinders that is served by the induction air circuit, a second tube that creates approximately a 180 degree turn in the induction airflow after the airflow has passed through the first tube, an air body that is located after the second tube and comprises a valve for controlling the airflow, a plenum zone that lies parallel to said first tube and is located after said air body, said plenum zone passing said bank of cylinders, and spiral runners that are arranged transversely to the length of said plenum zone, each runner extending from said plenum zone to a corresponding cylinder, wherein said runners, said plenum zone, and said first tube are a single plastic part, and said first tube and said plenum zone share respective wall portions of said runners as they pass said runners.

4,919,087

INTAKE SYSTEM FOR V-TYPE VEHICLE ENGINE

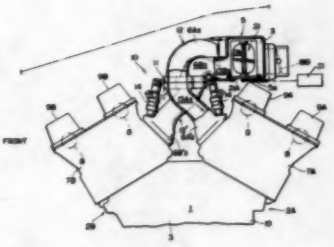
Muneyuki Ogami; Yasuhiro Kawasako; Takenori Otsuka; Tetsuo Hirsoka, and Koichi Hatamura, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Sep. 8, 1988, Ser. No. 241,727
Claims priority, application Japan, Sep. 8, 1987, 62-222976; Sep. 8, 1987, 62-222977
Int. Cl.[5] F02B *75/22*
U.S. Cl. 123—52 MV **15 Claims**

1. A V-type internal combustion engine having first and second cylinder banks set at an angle to each other to define a V-shaped space therebetween, each of said cylinder banks including a plurality of cylinders arranged in a lengthwise direction in which an output shaft of the V-type engine extends, and an intake system, said intake system comprising:

generally rectangular box-shaped first and second surge tanks arranged end to end in said lengthwise direction;

a first set of intake pipes spaced in said lengthwise direction for communicating said first surge tank with said cylinders in said first cylinder bank, respectively, each of said first set of intake pipes extending from a side wall of said first surge tank adjacent said V-shaped space toward each of said cylinders in said first cylinder bank and being bent downward and toward said V-shaped space; and



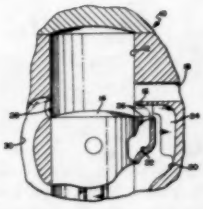
a second set of intake pipes spaced in said lengthwise direction for communicating said second surge tank with said cylinders in said second cylinder bank, respectively, each of said second set of intake pipes extending from a side wall of said second surge tank adjacent said V-shaped space toward each of said cylinders in said second cylinder bank and being bent downward and toward said V-shaped recess.

4,919,088

TWO CYCLE ENGINE SCAVENGING HEAT CONTROL

Roger B. Krieger, Birmingham, and Rodney B. Rask, Grosse Pointe Woods, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 21, 1989, Ser. No. 369,359
Int. Cl.[5] F02M *31/14*
U.S. Cl. 123—65 A **3 Claims**



1. A two cycle engine having a cylinder,

a scavenging and charging intake port opening into the cylinder,

a first fluid passage connecting the port with a source of scavenging and charging air,

a second fluid passage connecting the port with said air source,

heating means in said first passage for heating the air therein, and

valve means coacting with said passages to oppositely variably restrict flow therethrough and thereby control the degree of heating of scavenging and charging air delivered to the cylinder through said intake port.

4,919,089

VALVE OPERATING SYSTEM FOR INTERNAL COMBUSTION ENGINE

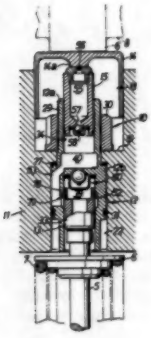
Yoshihiro Fujiyoshi; Hidenobu Nagase; Koichi Fukuo, and Takatoshi Aoki, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

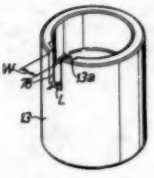
Filed Nov. 17, 1988, Ser. No. 273,202

Claims priority, application Japan, Nov. 19, 1987, 62-292621; Oct. 5, 1988, 63-251526

Int. Cl.[5] F01L *1/34, 1/14*

U.S. Cl. 123—90.16 **16 Claims**





1. A valve-operating system for an internal combustion engine, comprising a valve-driving piston slidably received in a cylinder body and operatively connected at one end thereof to an engine valve which is spring-biased in a closing direction, and a check valve and an orifice means interposed between hydraulic pressure generating means of generating an oil pressure for causing opening of the engine valve and a damper chamber defined between the cylinder body and the valve-driving piston, said check valve permitting flow of a working oil only from said hydraulic pressure generating means to the damper chamber, and said orifice means restricting returning of the working oil from the damper chamber to the hydraulic pressure generating means, wherein said orifice means comprises a hole having a constant length in the direction of oil flow, said hole being made sufficiently small to substantially reduce an influence on the flow of the working oil through the hole caused by viscosity variations of the working oil.

4,919,090

MOUNTING AID FOR INSTALLING VALVE ACTUATING ELEMENTS

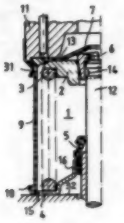
Hans Deuring, Burscheid; James H. Maguire, Langenfeld; Clifford R. Worsley, Leverkusen, all of Fed. Rep. of Germany, and Martin J. Whitehead, Sevenoaks, England, assignors to Goetze AG, Burscheid, Fed. Rep. of Germany

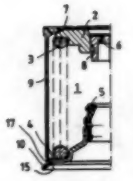
Filed May 15, 1989, Ser. No. 351,581

Claims priority, application Fed. Rep. of Germany, May 13, 1988, 3816321; Mar. 4, 1989, 3907001

Int. Cl.[5] F01L *3/08, 3/10*

U.S. Cl. 123—90.67 **22 Claims**





1. A mounting aid arranged for receiving a valve-actuating sub-assembly intended for installation coaxially about a valve stem, the sub-assembly including a valve coil spring, a spring retainer having a central aperture and a split collar, comprising

(a) a closing disc having an outer circumferential portion and being arranged for engaging a radially extending surface of the spring retainer coaxially therewith;

(b) an axial extension attached to said closing disc at the outer circumferential portion thereof; said axial extension having an end remote from said closing disc; and

(c) hold-back means formed on said end of said extension for releasably securing the sub-assembly to the axial extension.

4,919,091

IGNITION SWITCH ARRANGEMENT FOR AN INTERNAL COMBUSTION ENGINE HAVING AN ELECTRICAL IGNITION SYSTEM

Michael Wissmann, Schorndorf-Weiler; Harald Schleimann, Waiblingen, and Jürgen Weber, Kernen, all of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Jun. 21, 1989, Ser. No. 369,135

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1988, 3821958

Int. Cl.[5] F02D *37/02;* **F02P** *3/04*

U.S. Cl. 123—179 BG **12 Claims**

1. An ignition switch arrangement for a manually startable internal combustion engine equipped with an electrical ignition system, the ignition switch arrangement comprising:

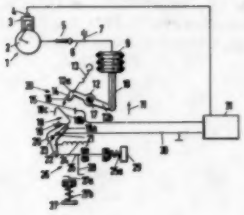
a positioning member actuable in dependence upon the operating condition of the engine for movement between a first position at which the engine is not running and a second position at which the engine is running;

an ignition switch unit switchable between an ignition-enabling position wherein the ignition system is operative and an ignition-disabling position wherein the ignition system is inoperative;

a latching actuator connected to said positioning member for moving between an unlatching position and a latching position in correspondence to the movement of said posi-

tioning member between said first position and said second position; and,

said latching actuator having latch means for latching said



ignition switch unit in said ignition-disabling position when said latching actuator is in said latching position and when said ignition switch unit is switched into said ignition-disabling position.

4,919,092

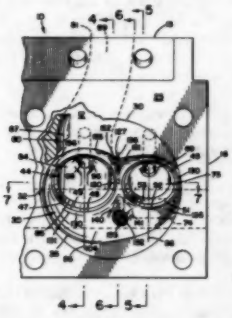
IN-LINE CYLINDER HEAD FOR INTERNAL COMBUSTION ENGINE

Richard W. Smith, Jr., and Michael E. Smith, both of Wooster, Ohio, assignors to TFS, Inc., Wooster, Ohio

Continuation-in-part of Ser. No. 94,125, Sep. 8, 1987, Pat. No. 4,773,382, which is a continuation of Ser. No. 47,295, May 8, 1987, abandoned, which is a continuation of Ser. No. 759,747, Jul. 29, 1985, Pat. No. 4,686,948. This application Mar. 10, 1988, Ser. No. 166,521

Int. Cl.[3] F02B 23/08

U.S. Cl. 123—188 M **5 Claims**



1. A cast cylinder head for an internal combustion engine using flat head pistons, said head including a flat mounting surface and having for each of several in-line circular piston areas:

(a) a wedge shaped combustion chamber extending from said mounting surface and defined by

(i) an especially configured, closed peripheral edge surface co-planar with said mounting surface and forming the opening of said combustion chamber;

(ii) a concave, contoured first cavity area extending from a continuous first portion of said peripheral edge surface and tapering into said head and away from from said mounting surface at a generally inclined first angle;

(iii) a concave, contoured second cavity area extending from the remaining portion of said peripheral edge surface and tapering into said head and away from said mounting surface at a generally inclined second angle, said second angle greater than said first angle;

(iv) said first cavity area intersecting said second cavity area along a roof line;

(b) a frusto-conical intake valve seat in said first cavity area having a major diameter circular edge surface and a minor diameter circular edge surface concentric with an intake valve axis, said major diameter intake edge spaced closer to said mounting surface than said minor diameter intake edge, said intake valve seat further divided, approximately and for reference purposes, into adjacent sequentially numbered, first, second, third and fourth quadrants, said second and third quadrants generally adjacent said peripheral edge surface, said fourth quadrant generally adjacent said second cavity area;

(c) a frusto-conical exhaust valve seat in said first cavity area having a major diameter circular edge surface and a minor diameter circular edge surface concentric with an exhaust valve axis, said major diameter exhaust edge spaced closer to said mounting surface than said minor diameter exhaust edge, said exhaust valve seat further divided, approximately and for reference purposes, into adjacent, sequentially numbered first, second, third and fourth quadrants, said second and third quadrants generally adjacent said peripheral edge surface, said fourth quadrant generally adjacent said second cavity area and said first quadrant of said exhaust valve seat and said first quadrant of said intake valve seat generally adjacent one another;

(d) a spark plug bore in said second cavity generally between said intake valve and said exhaust valve axis;

(e) intake passage means in said head for establishing fluid communication with said intake valve seat and exhaust passage means in said head for establishing fluid communication with said exhaust valve seat;

(f) said first cavity area having an annular exhaust spacing surface concentrically extending from said major diameter exhaust edge in a plane generally perpendicular to said exhaust valve axis and a generally frusto-conical funnelling surface extending from said exhaust spacing surface to said peripheral edge surface about at least portions of said second and third quadrants for funnelling exhaust gases through said exhaust valve seat;

(g) said first cavity area having an annular intake spacing surface concentrically extending from said intake major diameter edge in a plane generally perpendicular to said intake valve axis and a generally arcuate, concave surface extending from said intake spacing surface to said peripheral edge surface about at least portions of said second and third quadrants for sucking, in an unshrouded manner, a mixture of fuel and air through said intake valve seat;

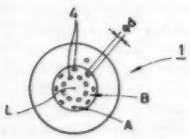
(h) said first portion of said peripheral edge surface which is generally adjacent said first quadrant of said intake valve seat and said first quadrant of said exhaust valve seat being configured as a V-shaped velocity increasing point; and

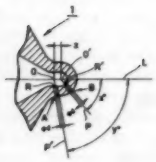
(i) said velocity increasing point defining the beginning of a ridge line extending into said first cavity area between said first quadrant portion of said intake valve seat and said first quadrant portion of said exhaust valve seat and gradually blending into and becoming co-planar with said exhaust spacing surface and said intake spacing at a point where said intake valve seat and said exhaust valve seat are closest to one another, a metal mass buildup on each side of said ridge line, said added metal mass blending from said intake spacing surface in a gradually contoured, concave manner into said ridge line over a portion of said intake valve's first and second quadrants and said added metal mass blending from said exhaust spacing surface in a frusto-conical manner into said ridge line over a portion of said exhaust valve's first and second quadrants to define a velocity increasing zone within said combustion chamber.

4,919,093
INTERNAL COMBUSTION ENGINE

Hikosaburo Hiraki; Toshibumi Murakami, and Akira Kusakabe, all of Tochigi, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

PCT No. PCT/JP88/00350, § 371 Date Dec. 5, 1988, § 102(e) Date Dec. 5, 1988, PCT Pub. No. WO88/08081, PCT Pub. Date Oct. 20, 1988
PCT Filed Apr. 7, 1988, Ser. No. 340,724
Claims priority, application Japan, Apr. 7, 1987, 62-51673[U]; Dec. 3, 1987, 62-183817[U]
Int. Cl.[5] F02M 61/04
U.S. Cl. 123—299 4 Claims





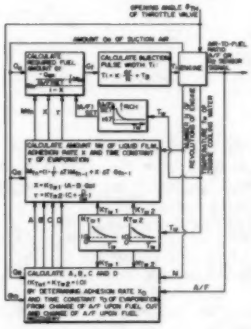
1. An internal combustion engine including a fuel injection device for feeding fuel in the interior of a combustion chamber through an injection nozzle, characterized in that said injection nozzle is formed with a plurality of injection holes arranged in two rows concentrically relative to the center axis of the injection nozzle, the respective injection holes in the upper row being arranged in a zigzag fashion relative to those in the lower rows, radially extending center axes of the respective injection holes in the upper row are arranged on the periphery of a circle of which center is located at a position on the center axis of the injection nozzle and radially extending center axes of the respective injection holes arranged in the lower row are arranged on the periphery of a circle of which center is located at a position on the center axis of the injection nozzle, said position being spaced away from said position by a predetermined distance Z, wherein the number of injection holes arranged in both the upper and lower rows is determined in the range of 14 to 20 in total and when it is assumed that a diameter of the respective injection holes is represented by d, the following conditions are satisfactorily met among a plurality of parameters comprising said distance Z, an angle X° assumed by center axes of the injection holes in the lower row relative to the center axis of the injection nozzle, an angle Y° assumed by center axes of the injection holes in the upper row relative to the center axis of the injection nozzle and a ratio F/D of diameter F of a cavity for the combustion chamber to diameter D of a bore

(I) $d<Z<4d$
(II) $45°<X°<60°$
(III) $75°<Y°<85°$
(IV) $0.5<F/D<0.7$.

4,919,094
ENGINE CONTROL APPARATUS

Toshio Manaka, Katsuta; Masami Shida, Mito; Teruji Sekozawa, Kawasaki, and Shinsuke Takahashi, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 207,526, Jun. 16, 1988, abandoned.
This application Jul. 13, 1989, Ser. No. 380,729
Claims priority, application Japan, Jun. 17, 1987, 62-149224
Int. Cl.[5] F02D 41/12
U.S. Cl. 123—326 25 Claims

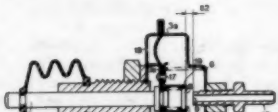

OPENING ANGLE θth OF THROTTLE VALVE
AMOUNT Qa OF SUCTION AIR
CALCULATE REQUIRED FUEL AMOUNT Qf
CALCULATE INJECTION PULSE WIDTH Ti
ENGINE
AIR-TO-FUEL RATIO SENSOR
NUMBER N OF REVOLUTIONS OF ENGINE
INJECTION PULSE WIDTH
CALCULATE AMOUNT Mf OF LIQUID FILM, ADHESION RATE X AND TIME CONSTANT τ OF EVAPORATION
CALCULATE A, B, C AND D
BY DETERMINING ADHESION RATE Xo AND TIME CONSTANT To OF EVAPORATION FROM CHANGE OF A/F UPON FUEL CUT AND CHANGE OF A/F UPON FUEL RECOVERY
A/F

1. An engine control apparatus comprising detecting means for detecting a condition of an engine, operation means for determining the adhesion rate of fuel and the time constant of evaporation of fuel in a fuel injection and suction system in a preestimating manner and determining the amount of fuel to be supplied on the basis of said adhesion rate, said time constant of evaporation and the condition of the engine detected by said detecting means, and fuel supply means for supplying fuel in accordance with the determined fuel supply amount, in which said operation means includes first operation means for calculating said time constant of evaporation on the basis of the amount of liquid film and the amount of fuel sucked into a cylinder after a fuel cut and calculating said adhesion rate on the basis of the amount of supply of fuel and the amount of fuel sucked into the cylinder after a fuel recovery.

4,919,095
DASHPOT FOR AN INTERNAL COMBUSTION ENGINE

Hideshige Gomi; Shoichi Matsumoto, and Harugi Yamazaki, all of Tokyo, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 16, 1988, Ser. No. 233,023
Claims priority, application Japan, Sep. 7, 1987, 62-223580
Int. Cl.[5] F02B 77/00
U.S. Cl. 123—328 8 Claims



1. A dashpot for an internal combustion engine having a throttle valve, the dashpot having a dashpot body, a diaphragm provided in the dashpot body for defining a pressure

chamber and an atmospheric chamber and having an orifice therein, a first spring in a neutral condition biasing the diaphragm to a predetermined position, an actuating rod secured to the diaphragm at an end of the rod and extending opposite to the pressure chamber and operatively connected to the throttle valve at the other end when the throttle valve is closed, comprising:

a supporting member secured to the diaphragm opposite to the actuating rod, disposed in the pressure chamber;

a spring loaded valve mounted on the supporting member;

a second spring for biasing the spring loaded valve toward a projected position;

a pipe secured to the dashpot body and having an opening at an end thereof, disposed in the pressure chamber, the opening being disposed to be closed by the spring loaded valve when the diaphragm is deflected by the throttle valve;

a solenoid operated valve arranged to communicate the pressure chamber with the atmosphere through the pipe when opened; and

the diaphragm and the spring loaded valve being arranged such that the spring loaded valve closes the opening of the pipe at a smaller stroke than that of the diaphragm.

4,919,096

ELECTRONIC THROTTLE CONTROLLING APPARATUS FOR USE IN AN INTERNAL COMBUSTION ENGINE

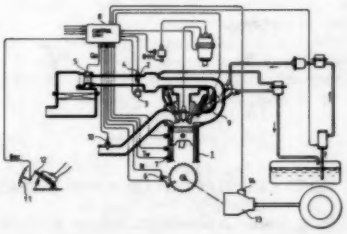
Toshio Manaka, Katsuta, and Masami Shida, Mito, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 22, 1988, Ser. No. 288,125

Claims priority, application Japan, Dec. 28, 1987, 62-330240

Int. Cl.[5] F02D *7/00, 41/00*

U.S. Cl. 123—399 **14 Claims**



1. In an electronic throttle controlling apparatus for use in an internal combustion engine of a motor vehicle having detect means for detecting an operation amount of an accelerator pedal and engine speed, and actuator means for controlling an intake air flow amount of the engine in accordance with a control signal, the improvement comprising memory means for storing data indicating a driving operation condition of the engine peculiar to the driving history of the motor vehicle and at least first and second maps each providing a different predetermined control characteristic of values of actuation of said actuator means according to values of operation amount of the accelerator pedal and engine speed provided by said detect means, and control means for generating said control signal for said actuator means on the basis of a value of actuation of said actuator means read from one of said maps selected on the basis of stored values of said driving operation condition of the engine.

4,919,097

ENGINE OUTPUT CONTROL SYSTEM

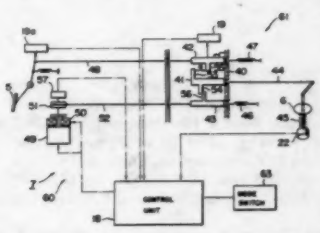
Syuzi Mitui, Hiroshima; Kouichirou Waki, Mihara, and Yasuhiro Harada, Kure, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Dec. 22, 1988, Ser. No. 288,266

Claims priority, application Japan, Dec. 23, 1987, 62-326162; Dec. 23, 1987, 62-326165

Int. Cl.[5] F02D *11/04, 11/10, 41/10*

U.S. Cl. 123—399 **17 Claims**



2. An engine output control system in accordance with claim 1 wherein the abnormality detecting means detects an abnormality of the electrical control means based on a voltage of a power supply applied for the electrical control means.

4,919,098

APPARATUS AND METHOD OF ELECTRONICALLY CONTROLLING ENGINE

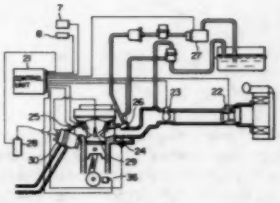
Kousaku Shimada, Katsuta; Teruji Sekozawa, Kawasaki, and Motohisa Funabashi, Sagamihara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 2, 1988, Ser. No. 266,875

Claims priority, application Japan, Nov. 5, 1987, 62-279874

Int. Cl.[5] F22D *1/40;* **F22B** *37/36*

U.S. Cl. 123—422 **21 Claims**



1. An electronic engine control apparatus comprising:

a plurality of sensors for detecting operating conditions of an engine which drives a vehicle;

a plurality of actuators for controlling the engine;

control means for calculating manipulated variables of said actuators on the basis of outputs of said sensors and for supplying the manipulated variables to said actuators to control the output torque of the engine;

means for measuring acceleration in the travelling directions of the vehicle;

differentiation means for calculating displacement difference per unit time of said measured acceleration to thereby detect differentiated acceleration as the longitudinal oscillation of the vehicle in the travelling direction; and

correction means responsive to said differentiation means for calculating a correction value, from the differentiated acceleration, of at least one of the manipulated variables of said actuators to correct the magnitude of the output

torque of the engine so as to cause its phase to be opposite to the phase of magnitude of said displacement difference of acceleration and for supplying the calculated correction value to said control means to correct the at least one of said manipulated variables.

4,919,099

COMBUSTION MONITORING

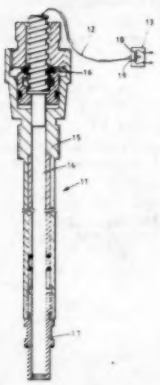
Philip Extance; Roger J. Hazelden, both of Solihull, and David Nutton, Barnsley, all of Great Britain, assignors to Lucas Industries PLC, Birmingham, England

Filed Mar. 14, 1988, Ser. No. 167,694

Claims priority, application United Kingdom, Mar. 12, 1987, 8705905

Int. Cl.[5] G01M *15/00*; F02D *41/14*; F02P *5/145*

U.S. Cl. 123—425 **14 Claims**



1. A method of monitoring combustion within a cylinder of a reciprocating piston internal combustion engine comprising deriving first and second intensity signals representative of light intensity within the cylinder by means of first and second optical transducers of spaced spectral response, said first and second optical transducers observing the combustion event at a common location, or at closely adjacent locations, establishing a ratio signal representing the ratio of said first and second intensity signals and having a fast rising leading edge, and using said fast rising leading edge of said ratio signal as, or to obtain, a control parameter for controlling at least one engine function by an engine control system.

12. A method of monitoring the oxides of nitrogen (NOx) content of the exhaust of a reciprocating piston internal combustion engine including monitoring light intensity within the cylinder, deriving first and second electrical signals representative of light intensity within the cylinder by means of first and second optical transducers of spaced spectral response, said first and second optical transducers observing the combustion event at a common location, or at closely adjacent locations, and, establishing a signal representing the ratio of said first and second electrical signals, said ratio signal being used as, or to obtain, a control parameter for an engine control system.

4,919,100

FUEL INJECTION CONTROL SYSTEM FOR AN AUTOMOTIVE ENGINE

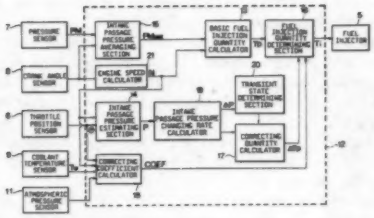
Mitsuo Nakamura, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 27, 1989, Ser. No. 344,270

Claims priority, application Japan, Apr. 30, 1988, 63-109501

Int. Cl.[5] F02D *41/10, 41/12*

U.S. Cl. 123—492 **4 Claims**



1. A system for controlling fuel injection of an engine for a motor vehicle having an intake passage, a throttle valve provided in the intake passage, and a fuel injector for injecting fuel, the system comprising:

an engine speed sensor producing an engine speed signal dependent on speed of the engine;

a throttle position sensor producing a throttle position signal dependent on opening degree of the throttle valve;

a pressure sensor producing a pressure signal dependent on pressure in the intake passage;

first calculator means responsive to the engine speed signal and the pressure signal for producing a basic fuel injection quantity signal;

estimating means responsive to the engine speed signal and the throttle position signal for estimating pressure in the intake passage and for producing an estimated pressure signal;

second calculator means for calculating a changing rate of the estimated pressure signal;

means responsive to the changing rate of the estimated pressure signal for producing a correcting signal;

corrector means for correcting the basic fuel injection quantity signal with the correcting signal, so as to determine the quantity of fuel to be injected.

4,919,101

FUEL SUPPLY CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Kunio Noguchi; Masayuki Ueno, and Kazushige Toshimits, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 8, 1988, Ser. No. 241,927

Claims priority, application Japan, Sep. 8, 1987, 62-224814

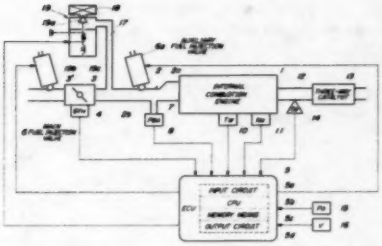
Int. Cl.[5] F02D *41/12*

U.S. Cl. 123—493 **13 Claims**

1. A fuel supply control system for an internal combustion engine having a plurality of cylinders, and an intake pipe connected to said cylinders and having a diversified portion and a united portion, said fuel supply control system including at least one fuel injection valve arranged in said united portion of said intake pipe, for supplying fuel to said cylinders, deceleration detecting means for detecting a predetermined decelerating condition of said engine, and fuel supply decreasing means for decreasing the supply of fuel to said engine through said fuel injection valve when said predetermined decelerating condition is detected by said deceleration detecting means, the improvement comprising:

(1) high-load detecting means for detecting whether said engine is in a predetermined high-load condition or not;

(2) first counting means associated with said high-load detecting means, for starting to count a first predetermined time period when said high-load detecting means detects that said engine has left said predetermined high-load condition; and



(3) inhibiting means associated with said first counting means and said deceleration detecting means, for inhibiting said fuel supply decreasing means from operating when said deceleration detecting means detects said predetermined decelerating condition of said engine before said first counting means completes counting said first predetermined time period.

4,919,102

FUEL PUMP DRIVING APPARATUS FOR VEHICLE

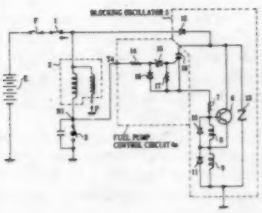
Hideo Iwabuchi, Saitama, Japan, assignor to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Jun. 2, 1989, Ser. No. 360,514

Claims priority, application Japan, Jul. 15, 1988, 63-175193

Int. Cl.[5] F02M *39/00*

U.S. Cl. 123—499 **6 Claims**



1. A fuel pump driving apparatus for a vehicle, comprising a fuel pump, a blocking oscillator, including a transistor and a bias circuit therefor, for driving said fuel pump, and a control circuit for controlling an oscillating operation of said blocking oscillator,

said control circuit driving said blocking oscillator upon reception of an ignition pulse generated from an ignition coil in accordance with rotation of an engine,

wherein said control circuit comprises

a silicon controlled rectifier whose input side is series-connected to a bias circuit of said blocking oscillator, and

circuit means, connected to a gate of said silicon controlled rectifier and including a Zener diode, for voltage-dividing the ignition pulse, and

said bias circuit for said transistor of said blocking oscillator is designed to set a current which is flowed therethrough when the transistor is OFF to be lower than a holding current of said silicon controlled rectifier.

4,919,103

DEVICE FOR CONTROLLING EVAPORATIVE EMISSION FROM A FUEL TANK

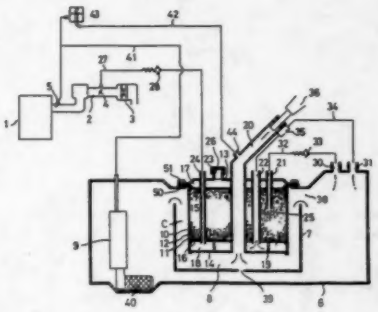
Yuji Ishiguro, Toyohashi; Hiroyuki Hosokawa, Chita; Nobuhiko Koyama, Nagoya; Eiji Hiramatsu, Anjo; Mitsunori Takao, Kariya; Tomoaki Abe, Oobu; Masashi Kiyono, Anjo; Katsuya Maeda, Kariya, and Shigeru Kamio, Nagoya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jan. 20, 1988, Ser. No. 145,909

Claims priority, application Japan, Feb. 28, 1987, 62-45825; Apr. 20, 1987, 62-96859

Int. Cl.[5] F01M *25/00*

U.S. Cl. 123—514 **12 Claims**



1. An apparatus for treating evaporative fuel used by an internal combustion engine, comprising:

a fuel tank;

a partitioning wall provided within the fuel tank to define a small fuel storage chamber within the tank;

a canister container housed in the small fuel storage chamber;

fuel adsorbing material stored with the canister;

a fuel feeding pipe for feeding fuel into the small fuel storage chamber; and

a fuel return pipe for introducing high temperature return fuel into the small fuel storage chamber;

the above-mentioned elements being arranged such that when fuel is introduced into the tank, it flows into the small fuel storage chamber through the fuel feeding pipe to cool the canister container whereas when the engine is operated, high temperature return fuel is introduced into the small fuel storage chamber through the fuel return pipe to heat the canister container thereby promoting an adsorbing and de-adsorbing action of fuel by the fuel adsorbing material.

4,919,104

RECIPROCATING MACHINE

Hartmut Hensel, Duvehof 1, 3000 Hannover 1, Fed. Rep. of Germany; Oliver Laing, 3970 Honeycutt St., San Diego, Calif. 92109, and Karsten Laing, Hofenerweg 37, 7148 Remseck-2, Fed. Rep. of Germany

Filed Dec. 30, 1985, Ser. No. 814,992

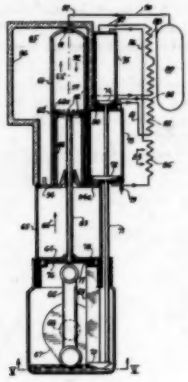
Claims priority, application Fed. Rep. of Germany, Dec. 27, 1984, 3447459

Int. Cl.[5] F02M *23/00*

U.S. Cl. 123—533 **10 Claims**

1. A piston-type diesel engine which comprises a cylinder, a gas-lubricated piston reciprocating in the cylinder and acting via a thrust rod on kinematic means transforming the reciprocating movement into rotation, drive means for rotating the piston around its axis; and the piston being rotatably connected to the kinematic means; the cylinder and piston being made of

a ceramic material; means for feeding the cylinder with compressed air; and means for conveying exhaust gases to a second



cylinder of a secondary positive displacement piston-type machine.

4,919,105

DEVICE FOR IMPROVING MIXTURE DISTRIBUTION IN AN INTAKE TUBE OF A COMBUSTION ENGINE

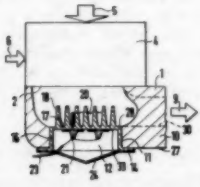
Heinz Duelli, Hohenems, Austria, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 16, 1988, Ser. No. 285,676

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1988, 3805927

Int. Cl.[5] F02M *29/00*

U.S. Cl. 123—590 **28 Claims**



1. A device for improving a fuel-air mixture distribution in a portion of an intake tube for an internal combustion engine, which comprises a fuel-air mixture distribution device (12) having a basic body (17), relatively steep, individual separately spaced upright, nail-like protrusions (18) protruding from said basic body (17) into said portion of the intake tube, a heating means connected to said fuel-air mixture distribution device for heating said protrusions and said basic body, and at least one fuel-air mixture guide wall (20) connected to said fuel-air mixture distribution device (12), said at least one fuel-air mixture guide wall protruding from said fuel-air mixture distribution device substantially in a direction of said protrusions (18), and disposed among and within an immediate vicinity of said protrusions (18) that extend into the intake tube portion.

4,919,106

IGNITION DISTRIBUTOR FOR AN INTERNAL COMBUSTION ENGINE

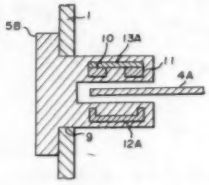
Seiki Kodama, and Shigemi Murata, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 177,044, Apr. 4, 1988, abandoned. This application Apr. 6, 1989, Ser. No. 333,809

Claims priority, application Japan, Apr. 17, 1987, 62-95827

Int. Cl.[5] F02P *7/06, 5/04*

U.S. Cl. 123—617 **2 Claims**



1. An ignition distributor for an internal combustion engine, said injection distributor comprising:

(a) a housing of a generally cylindrical form;

(b) a shaft which, in use, is rotated around a central axis by said internal combustion engine in said housing;

(c) a sensor attached to the cylindrical part of said housing; and

(d) a magnetic-permeable member fixed to said shaft and extending to face said sensor but to be spaced therefrom by a gap so that, in use, a signal for each cylinder of said internal combustion engine is generated when said shaft is rotated,

wherein:

(e) said magnetic-permeable member comprises a flat-plate-like portion having a rectangular cross-section in a plane containing said central axis, a uniform thickness in the direction parallel to said central axis, and a uniform length in the direction perpendicular to said central axis, said length being much greater than said thickness;

(f) said cylindrical part of said housing has an opening formed therein at the same level as the position of said flat-plate-like portion; and

(g) said sensor comprises:

(i) a radially outward portion having a rectangular cross-section in a plane that contains said central axis, said radially outward portion being located outside of said cylindrical part of said housing and being too large to fit through said opening;

(ii) a radially inward sensor portion which extends into said housing through said opening, said radially inward sensor portion having a uniform thickness in the direction parallel to said central axis at least approximately equal to the height of said opening and having a radially extending slot in its radially inward surface sized, shaped, and positioned so as to receive a part of said flat-plate-like portion and to divide said radially inward sensor portion into a first leg portion and a second leg portion;

(iii) a permanent magnet mounted in one of said first and second leg portions; and

(iv) a hall element mounted in the other one of said first and second leg portions, whereby:

(i) said gap can be accurately and uniformly dimensioned and stably maintained and

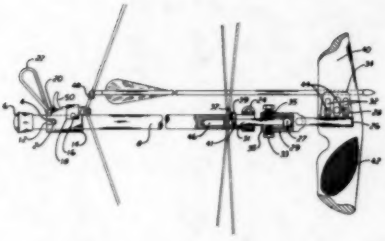
(ii) the shape of the signals obtained by the rotation of said magnetically-permeable member relative to said sensor is sufficiently distinct to be suitable for digital treatment.

4,919,107

EQUALIZED FORCE SHOOTER FOR A BOW AND ARROW

Walter A. Bunts, Crystal River, Fla., assignor to Walter A. Bunts, Crystal River, Fla.

Filed Jun. 27, 1988, Ser. No. 211,975
Int. Cl.[5] F41B 5/00
U.S. Cl. 124—24 R 3 Claims



1. An apparatus for mechanically locating and maintaining the precise location of the tuned condition of an archers bow and arrow, comprising:

a slide rod mount having a forward and rearward end;

attachment means for rigidly fastening said forward end of said slide rod mount positioned approximately at the middle portion of the bow;

a sleeve having a forward and rearward end and a bore.

means to rigidly connect said forward end of said sleeve to said rearward end of said slide rod mount;

a ball and socket joint;

means to securely attach said ball and socket joint to said forward end of said sleeve within the bore of said sleeve;

a mounting shaft having a forward and rearward end;

a forward portion of said mounting shaft having a smaller diameter than the bore of said sleeve is located within said sleeve;

means to rigidly connect said forward end of said mounting shaft to the ball of said ball and socket joint;

said mounting shaft extends rearward out of said sleeve, and approximately perpendicular to the longitudinal axis of the bow;

a plurality of adjusting screws pass through a rearward portion of said sleeve allowing said mounting shaft to be located and to rigidly hold said mounting shaft at the proper tuned location;

a slide rod having a forward and rearward end;

said forward end of said slide rod rigidly attached to said rearward end of said mounting shaft;

a slide having a forward and rearward end;

said slide slidably surrounds said slide rod;

said slide having a guide pin locator notch at said rearward end of said slide;

means attached to said slide to rigidly hold an archers trigger release mechanism onto said slide to allow the bow string and said slide to be drawn rearward from a middle portion of the bow and parallel to the axis of said slide rod;

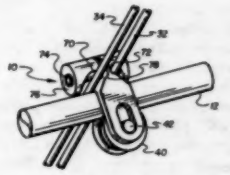
a guide pin located at a rearward portion of said slide rod to locate said guide pin notch to said guide pin, allowing said slide and a bow string to be drawn to its correct tuned position.

4,919,108

CABLE GUARD ASSEMBLY FOR COMPOUND BOWS

Marlow W. Larson, Ogden, Utah, assignor to Browning, Morgan, Utah

Filed Nov. 8, 1989, Ser. No. 434,096
Int. Cl.[5] F41B 5/00
U.S. Cl. 124—88 7 Claims



1. In a compound bow of the type which includes a handle riser, a pair of opposed limbs extending from the opposite ends of said handle riser, eccentric members pivotally mounted at the distal ends of said limbs, a rigging system including said eccentrics, a central stretch including a bowstring segment and a pair of end stretches, said end stretches each extending from a said eccentric across said handle riser to the limb opposite said eccentric, and a cable guard rod cantilevered from attachment to said handle riser past and adjacent said end stretches,

a fixture reciprocally mounted to said stabilizer rod and slidably coupled to said end stretches so that as said bowstring is pulled from rest position to a drawn position, thereby flexing said limbs, said fixture is caused to move along said cable guard rod away from said handle riser by said end stretches while holding said end stretches away from the travel path of an arrow launched by said string;

said fixture comprising:

a body member with a pair of legs straddling said cable guard rod, said legs each having proximal and distal ends;

structure connecting the proximal ends of said legs;

a roller rotatably mounted on an axle between the distal ends of said legs, said roller having a concave contact surface adjacent said cable guard rod; and

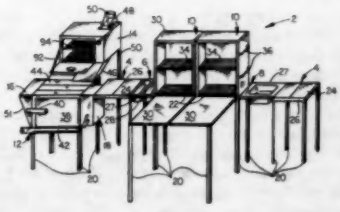
a cable-retaining member extending from said body member opposite said distal ends of said legs, said member including a pair of cable-receiving grooves, each said groove being configured to engage a respective said end stretch against a convex contact surface.

4,919,109

PACK KITCHEN WITH AIRTIGHT STOVE AND FLUE OVEN

M. Orville Riley, P.O. Box 817, Townsend, Mont. 59644

Filed Mar. 21, 1988, Ser. No. 170,947
Int. Cl.[5] F24C 1/16
U.S. Cl. 126—9 R 7 Claims



1. Portable, stowable camp kitchen apparatus comprising:

(a) a multi-walled sheet metal wood burning stove comprising;

(i) a pair of vertical side walls,

(ii) a rear end wall,

(iii) a front wall having a latchable hinged door opening to a fire box and a slidale door mounted beneath the latchable door and opening to at least a lower portion of said fire box,

(iv) an external bottom wall,

(v) an imperforate interior bottom wall defining the bottom of the firebox and dividing the fire box from an air cavity between the internal and external bottom walls,

(vi) a cook top comprised of a plurality of elongated panels assembled to form an essentially airtight cooking surface, each panel having a flat horizontal portion and formed peripheral edges, wherein one edge is bent to a U-shape and an opposite edge is bent to slip mount within the U-shaped edge of an adjacent panel and wherein others of said edges are rigidly secured to the stove walls, and including an aperture to the fire box circumscribed by a plurality of flange members; and

(b) a flue member, at least one end of which includes a flange portion transversely mating with the circumscribing flange members and whereby combustion gases are exhausted from said fire box.

4,919,110

GAS COOKING APPLIANCE

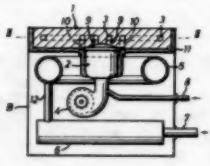
Nobuyoshi Yokoyama, Nagoya, Japan, assignor to Paloma Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Jul. 25, 1988, Ser. No. 223,366

Claims priority, application Japan, Jul. 25, 1987, 62-114402[U]

Int. Cl.[5] F24C *3/00*

U.S. Cl. 126—394 **7 Claims**



1. A gas cooking appliance for cooking chow mein, pan cakes or the like on a hot plate mounted thereon, comprising:

a pulse combustion burner, installed within an internal compartment of the appliance and having an combustion chamber coupled with a bottom portion of said hot plate suitable to effect pulse combustion of a mixture of gaseous fuel and air supplied thereinto;

wherein said hot plate is in the form of a thick metallic plate having therein a tailpipe passage which is connected at one end thereof to an exhaust port of said combustion chamber and extends outwardly through said metallic plate to permit the flow of combustion products, discharged therethrough, from said combustion chamber.

4,919,111

IGNITING APPARATUS

Jiro Ohsawa, Tokyo, Japan, assignor to Win Lighter Corporation, Tokyo, Japan

Filed Nov. 4, 1988, Ser. No. 267,298

Claims priority, application Japan, Jun. 16, 1988, 63-149024; Jul. 19, 1988, 63-95463[U]

Int. Cl.[5] A47J *37/00*; F23D *14/46*

U.S. Cl. 126—25 B **15 Claims**

1. An elongated ignition apparatus comprising:

(a) a grip member, an ignition member and a middle member uniting together said grip member on one end and said ignition member on the other end,

(b) a fuel reservoir disposed in said grip member and having a gas supply valve,

(c) a burner nozzle coupled to said ignition member and being connected to the gas supply valve via a gas pipe,

(d) an electric spark generator disposed in the ignition member for generating a spark in the vicinity of the burner nozzle with electrical contact,

(e) means disposed in the ignition member for actuating the gas supply valve,

(f) the gas pipe uniting said reservoir and the said burner nozzle and

(g) release means operatively coupled to the gas supply valve for releasing gas in correspondence with actuation of said actuator means.

4,919,112

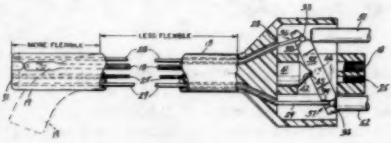
LOW-COST SEMI-DISPOSABLE ENDOSCOPE

Walter P. Siegmund, Windham, Conn., assignor to Schott Fiber Optics, Southbridge, Mass.

Filed Apr. 7, 1989, Ser. No. 334,335

Int. Cl.[5] A61B *1/00*

U.S. Cl. 128—4 **18 Claims**



1. An endoscope having a disposable shaft comprising:

a control handle,

a separable, disposable, flexible shaft having a distal end and a proximal end,

connector means for connecting the control handle and the shaft releasably,

movable means incorporated in said shaft for flexing the distal end of the shaft, and,

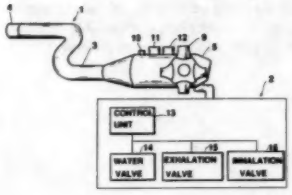
power means in said handle for making a separable driving connection with said movable means for articulating the distal end of said shaft.

4,919,113

METHOD OF CLEANING SCOPE END OF ENDOSCOPE AND ENDOSCOPE WITH SCOPE END CLEANING MECHANISM

Yutaka Sakamoto, Fukushima, and Ryuichi Kamaga, Tochigi, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 6, 1989, Ser. No. 361,976
Claims priority, application Japan, Jun. 10, 1988, 63-141692
Int. Cl.[5] A61B *1/12*
U.S. Cl. 128—4 **14 Claims**



1. A method of cleaning a scope end of an endoscope, comprising the steps of:

injecting water on the scope end for washing out the scope end;

exhaling air on the scope end to blow away remaining drops on the scope end of the water injected at the injecting step; and

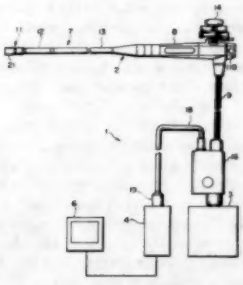
inhaling substantially as much an amount of air as exhaled at the exhaling step, slowly enough not to cause dew condensation due to an abrupt pressure decrease.

4,919,114

ENDOSCOPE PROVIDED WITH FLEXIBLE SIGNAL WIRES

Atsushi Miyazaki, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jan. 9, 1989, Ser. No. 294,437
Claims priority, application Japan, Jan. 14, 1988, 63-005925
Int. Cl.[5] A61B *1/04*
U.S. Cl. 128—6 **7 Claims**



1. An endoscope including:

a flexible insertable part;

a solid state imaging device obtaining an optical image of an observed part through an observing window provided in a tip part of said insertable part; and

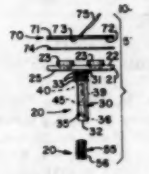
signal wires inserted through said insertable part, electrically conducted to said solid state imaging device and said signal wires having parts with higher flexibility than other parts thereof in a lengthwise direction.

4,919,115

ARROW REST SPACER

Allen W. Miller, 32 Champagne, Lake St. Louis, Mo. 63367

Filed Sep. 11, 1989, Ser. No. 405,866
Int. Cl.[5] F41B *5/00*
U.S. Cl. 124—24 R **16 Claims**



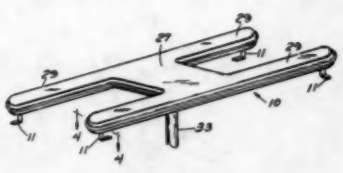
12. An arrow rest spacer for use with a bow having a riser with a handle part and a generally flat sided cut-away part extending above said handle part, a broad face of said cut-away part being oriented in a direction generally parallel to the shaft of an arrow being shot, and said cut-away part having an internally threaded passage extending entirely through it generally perpendicular to said broad face, said arrow rest spacer comprising a face plate and an elongated generally straight shaft connected at an inner end of said shaft to one side of said face plate and projecting therefrom to an outer end of said shaft, said shaft having a channel opening through and extending axially from said outer end of said shaft, said channel being open along one side of said shaft, a bottom wall of said channel being thicker at an inner part of the channel than it is at the outer end of said channel to form a shallower channel area in said inner part, and an externally threaded plug the threads of which are of the same pitch as the internal threads of said threaded passage, said shaft being of a size to fit closely but slideably in said threaded passage, said plug being of a diameter to be received into said channel at its outer end and to engage the threads of said threaded passage and to tighten the shaft securely against axial movement as said plug is screwed into said shallower channel part.

4,919,116

GAS BURNER ELEMENT WITH UNIVERSAL SUPPORTS

Earle L. Pfefferkorn, Racine, Wis., assignor to Greene Manufacturing Co., Racine, Wis.

Filed May 15, 1989, Ser. No. 352,834
Int. Cl.[5] F24C *3/00*
U.S. Cl. 126—41 R **9 Claims**



1. A gas burner element adapted for mounting within a burner kettle having spaced holes formed in the floor thereof, the element including: a body member defining a diffusion

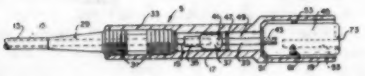
chamber and a plurality of burner arms extending from said chamber, said arms having a plurality of holes for flowing gas therethrough; a support member received in each of said arms for maintaining said element in an adjustable, spaced relationship from a burner kettle, said support member including a generally vertical shaft threadably engaged to said arm and a foot portion disposed radially to said shaft, said foot portion having a width and a length substantially greater than said width, said burner element thereby being adapted to be adjustably supportable in areas of the kettle floor which are devoid of holes, irrespective of the height at which the burner element is supported, said relationship between said burner kettle and said burner element being adjustable by rotating said vertical shaft, thereby extending or retracting said support member with respect to tis related burner arm.

4,919,117

FACIAL AND BODY MASSAGE APPARATUS AND METHOD

Thomas P. Muchisky, 26 Westwood Country Club, St. Louis, Mo. 63131, and James V. Young, University City, Mo., assignors to Thomas P. Muchisky, St. Louis, Mo.

Filed Feb. 21, 1989, Ser. No. 313,054
Int. Cl.[5] A61H 7/00
U.S. Cl. 128—62 R **20 Claims**



1. A facial and body massage apparatus for skin cleansing-/exfoliation comprising:

a massage applicator having a handle and a massage head;

said massage head including a body massage element for contacting the face or body of a user;

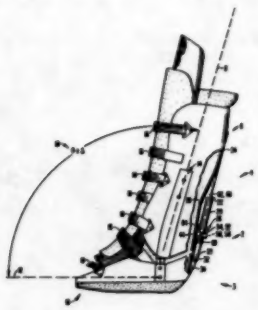
means for rotating said body massage element about an axis aligned with said handle and also for simultaneously orbiting said element in a path about said axis to continuously re-position said body massage element about said axis during rotation thereof.

4,919,118

MOTION LIMITER FOR SHORT LEG WALKER

John C. Morris, Castro Valley, Calif., assignor to Orthopedic Technology, Inc., San Leandro, Calif.

Filed Aug. 14, 1989, Ser. No. 394,398
Int. Cl.[5] A61F 5/04
U.S. Cl. 128—88 **21 Claims**



1. A motion limiter for a short leg walker of the type having an upper member joined to a lower member to permit relative movement therebetween, the motion limiter comprising:

a shaft having a first end, a second end, a length therebetween and defining a cross section, the second shaft end adapted to be pivotally attached to a chosen one of the upper and lower members;

a guide having upper and lower surfaces and defining a hole therethrough sized to accommodate the cross section of said shaft, the guide adapted to be pivotally attached to the unchosen one of the upper and lower members;

said shaft being disposed within said hole whereby a sliding movement of the shaft through said guide is permitted as the first and second members move relative to one another; and

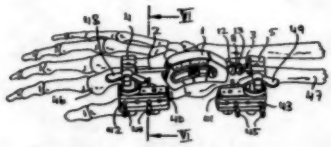
first and second stop members positioned along the shaft on either side of the guide to limit the movement of the shaft through the guide thereby limiting the range of motion of the upper member relative to the lower member, at least said first stop member being adjustably positionable along the shaft to adjust said range of motion.

4,919,119

EXTERNAL DYNAMIC BONE FIXATION DEVICE

Ulf Jonsson, Lidingo, Sweden, and Marcel Wagenknecht, Le Lignon, Switzerland, assignors to Jaquet Orthopedie, S.A., Geneva, Switzerland

Filed May 16, 1986, Ser. No. 863,756
Int. Cl.[5] A61F 5/04
U.S. Cl. 606—54 **16 Claims**



1. A dynamic external bone fixation device for the osteosynthesis of a broken joint, comprising:

(1) a first part comprising a first fixation rod having an axis a_1 for connection to bone pins introduced into the bone on one side of said joint,

(2) a second part comprising a second fixation rod having an axis a_2 for connection to bone pins introduced into the bone on the other side of said joint, and

(3) an articulating portion joining said first part and said second part, said articulating portion comprising:

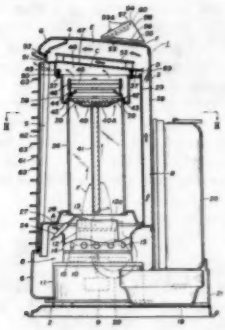
(a) a first curved surface to which said first part is connected and which fits with a second curved surface to which said second part is connected so as to allow adjustably limited movement of said first part with respect to said second part, both said first curved surface and said second curved surface having a common virtual axis spaced apart from said device, and

(b) means for locating said common virtual axis so that said virtual axis may be aligned with the axis of said joint, wherein said means for locating said virtual axis is an integral element of said device.

4,919,120
RADIANT-TYPE HEATER

Tadao Horikoshi, Tatebayashi; Hisao Naganuma, Ashikaga; Minoru Sugimoto, Iwafune, and Masanobu Numao, Ashikaga, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Jun. 6, 1989, Ser. No. 361,868
Claims priority, application Japan, Jun. 9, 1988, 63-142435; Jun. 10, 1988, 63-144038; Jun. 10, 1988, 63-77649[U]
Int. Cl.[5] F24C *5/00*
U.S. Cl. 126—93 6 Claims



1. A radiant-type heater comprising:
an exterior case having an opening in a front surface thereof, an upper space defined in an upper portion of the case and a lower space defined in a lower portion of the case;
a deflection plate mounted in said upper space;
a burner mounted in said lower space and having a plurality of flame holes formed therein adapter to have a fuel-air mixture flow therethrough; and
a heating element suspended downwardly from said deflection plate toward said burner, said heating element including a curved portion with a concave side and a convex side, said convex side of said curved portion of said heating element facing said opening in said front surface of said exterior case.

4,919,121
INFLATION DEVICE FOR ANGIOPLASTY CATHETER

Mark A. Rydell, Golden Valley, and Rick L. Shockey, Eagan, both of Minn., assignors to Schneider (USA) Inc., A Pfizer Company, Minneapolis, Minn.

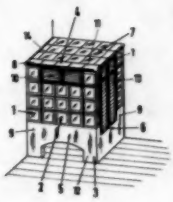
Filed Feb. 6, 1989, Ser. No. 306,047
Int. Cl.[5] A61M *29/00*
U.S. Cl. 604—97 8 Claims

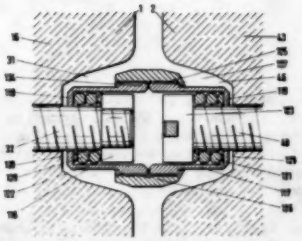
1. An inflation device for a transluminal angioplasty catheter of the type including an elongated, flexible plastic tube having a proximal end and a distal end, said distal end supporting an expander member thereat, said inflation device comprising:
(a) a syringe housing for retaining a tubular syringe body therein, said syringe body having a piston receiving bore, a fluid outlet port at its distal end, and means for coupling said oulet port to the proximal end of said catheter, said syringe housing including an internally threaded annular surface at the proximal end thereof, said annular surface being of a predetermined internal diameter;
(b) a syringe plunger having a proximal end, a distal end and a piston member on said distal end of said plunger, said plunger being insertable into said piston receiving bore of said syringe body and having a longitudinally extending bore with a longitudinal slot formed through the wall of said cylindrical plunger extending from said longitudinal bore to the exterior of said cylindrical plunger, the outer diameter of said cylindrical plunger being less than said predetermined internal diameter of said annular surface on said plunger housing and a piston member on said distal end of said plunger;
(c) an externally threaded member disposed in said longitudinal slot for radial movement between a first position wherein the threads on said externally threaded member are out of engagement with said internally threaded annular surface and a second position where said threads on said externally threaded member engage said internally threaded annular surface; and
(d) manually actuable means disposed in said longitudinal bore in said plunger for selectively moving said externally threaded member between said first and second positions, whereby rotation of said syringe plunger within said syringe housing produces axial movement of said piston within said piston receiving bore when said externally threaded member is in said second position.

4,919,122
ELEMENT STRUCTURE AND PROCESS FOR ASSEMBLING SAME

Siegmar Kohlenbrenner, Im Wiedenberg 25, 7321 Ottenbach, Fed. Rep. of Germany

Continuation of Ser. No. 11,466, Feb. 5, 1987, abandoned. This application Jan. 13, 1989, Ser. No. 296,836
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1986, 3603419
Int. Cl.[5] F24C *15/00*; E04B *1/00*
U.S. Cl. 126—98 30 Claims





1. A process for the erection of a structure made of prefabricated modular elements, comprising the steps of:
(a) providing prefabricated modular elements of appropriate

configurations and sizes, each modular element containing a tensioning element positioned therein to be concealed from viewing upon assembly of the structure;

(b) provide tightening members and coupling pieces to cooperatively apply tension to the tensioning elements as the structure is assembled and, thereby, to relieve the modular elements from tension;

(c) placing the coupling pieces on the tightening members, the tightening members being positioned to fit between the tensioning elements;

(d) erecting the structure by individually placing the modular elements against each other in abutting relationship, the placing of each modular elements being determined by the configuration of the structure to be assembled;

(e) continually placing the tensioning elements under tension as the structure is assembled, the tensioning elements cooperating with the tightening members and coupling pieces positioned between the tensioning elements to provide said tension;

(f) creating openings within the structure exactly sized to received each modular element, including a final modular element, said openings remaining constant in size regardless of expansion or shrinking of the modular elements or the tensioning elements; and

(g) inserting the final modular element into position in the structure from any open side of the last opening.

4,919,123

FILTER BASE FOR FORCED AIR FURNACE

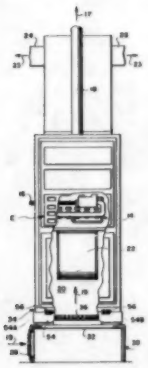
Jerry D. Jackson, 6969 Lakewood Blvd., Dallas, Tex. 75214, and Terry D. Youngblood, 10844 Waterbridge Clr., Dallas, Tex. 75218

Continuation of Ser. No. 157,604, Feb. 19, 1988, Pat. No. 4,827,901. This application Jan. 24, 1989, Ser. No. 301,613

The portion of the term of this patent subsequent to May 9, 2006, has been disclaimed.

Int. Cl.[5] F24H *3/02*

U.S. Cl. 126—110 R **3 Claims**



1. In a forced air system for circulating conditioned air to and from a building space, said forced air system including an air conditioning unit having a housing enclosing a heat exchanger and a blower fan disposed in said housing for inducing air flow across said heat exchanger, and return air plenum means disposed in air flow communication with said heat exchanger, said return air plenum means having an inlet opening for receiving return air from said building space and having an outlet opening through which return air is discharged into said housing and across said heat exchanger, the improvement comprising:

a modular filter assembly providing mechanical foundation support for said air conditioning unit, said modular filter assembly resting on said return air plenum means and supporting the weight load of said conditioning unit; said filter assembly having a housing including sidewall panel portions defining the boundary of an air flow passage and providing mechanical support for the weight load imposed by said air conditioning unit, said air flow passage being disposed in series air flow communication with said plenum means outlet opening and said heat exchanger; filter support means attached to said filter housing for slideably receiving and supporting a removable filter element in said air flow passage; said filter housing having an access opening through which a filter element can be loaded onto and retrieved from said filter support means; and a cover plate mounted on said filter housing for movement from a first position overlapping the filter housing wall portions surrounding said access opening to effect sealed closure thereof, to a second position removed away from and uncovering said access opening to provide access to said filter support means, said cover plate being adapted to be drawn toward said filter housing wall surface by a suction force developed by the flow of return air conducted through said air flow passage to effect sealed closure of said access opening during operation of said forced air system.

4,919,124

AIRCRAFT AIRCREW LIFE SUPPORT SYSTEMS

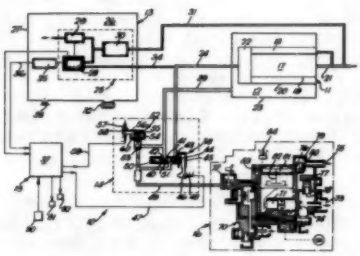
George F. Stevenson, and Ronald F. Cassidy, both of Yeovil, England, assignors to Normalair-Garrett (Holdings) Ltd., Somerset, England

Filed Dec. 12, 1988, Ser. No. 282,571

Claims priority, application United Kingdom, Dec. 18, 1987, 8729501

Int. Cl.[5] A61M *15/00*

U.S. Cl. 128—202.26 **8 Claims**



1. An aircraft aircrew life support system comprising an onboard oxygen generating system (OBOGS) for delivering oxygen-enriched product gas, breathing demand regulator means connected for receiving oxygen-enriched product gas, said regulator means including means for permitting aircraft cabin air to enter said regulator means and mix with said OBOGS product gas in one operating mode of said regulator means and mode switching means for switching said regulator means betwen a mode in which undiluted OBOGS product gas is delivered in response to breathing demands and a mode in which OBOGS product gas diluted with aircraft cabin air is delivered in response to breathing demands, plenum storage means connected for receiving OBOGS product gas and for supplying said gas to said regulator means, gas concentration sensor means connected for sensing concentration of oxygen in product gas delivered by said OBOGS and adapted to output oxygen concentration signals, an OBOGS product gas supply valve adapted for controlling said OBOGS product gas to be delivered to said regulator means from said OBOGS or said plenum storage means, a plenum storage charge valve adapted

for controlling charging of said plenum storage means by said OBOGS product gas, and electronic control means connected for receiving oxygen concentration signals form said gas concentration sensor means and mode signals from said mode switching means and adapated to compute said signals and output control signals to said OBOGS product gas supply valve and faid pelnum storage charge valve, whereby when oxygen concentration in product gas delivered by said OBOGS is sensed to have fallen below a predetermined minimum concentration percentage or on failure of OBOGS product gas supply said product gas supply valve is switched to inhibit the flow of product gas from the OBOGS to said regulator and to connect said regulator means with said plenum storage means, and when oxygen concentration is said OBOGS product gas is sensed to be above the predetermined minimum concentration percentage and said regulator means is in a mode in which OBOGS product gas diluted with aircraft cabin air is being delivered in response to breathing demands said plenum storage charge valve is switched to permit OBOGS product gas to charge said plenum storage means.

4,919,125

ANAESTHETIC VAPORISERS

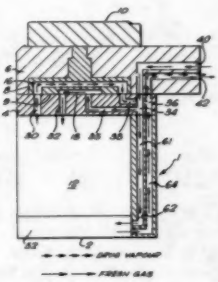
Robert A. Heaton, Skipton; Stuart C. Leach, Ilkley; Joseph Hancock, Bagslate, and Neil A. Sandy, Silsden, all of England, assignors to BOC Group PLC.

Filed Apr. 24, 1989, Ser. No. 341,984

Claims priority, application United Kingdom, Apr. 27, 1988, 8809897

Int. Cl.[5] A61M *15/00*

U.S. Cl. 128—203.14 **5 Claims**



1. An anaesthetic vaporiser of the by-pass type in which carrier gas is initially divided into a first stream passing through a vaporising chamber containing volatile liquid anaesthetic agent thereby entraining vapour from the volatile liquid anaesthetic agent and a second by-pass stream, the two streams subsequently recombining prior to leaving the vaporiser for delivery to a patient, comprising a thermally responsive valve located in the second, by-pass stream, the vaporising chamber including a base made from a material with a high thermal conductivity, the thermally responsive valve being located immediately below the base in the normal orientation of the vaporiser.

4,919,126

FLEXIBLE ORAL AIRWAYS AND METHODS

David E. Baildon, Callahan Rd., P.O. Box 2647, Lake City, Fla. 32056-2647

Filed May 8, 1987, Ser. No. 47,324

Int. Cl.[5] A61M *16/00*

U.S. Cl. 128—207.14 **45 Claims**

1. An oral airway comprising:

an airway member having dimensions generally conforming to the dimensions of human airways, said airway member formed from a plastic material which is easily molded to the configuration of a specific patient airway during insertion, said member having an air passageway extending longitudinally therethrough; and

a spine extending longitudinally through and fixed with said airway member and generally parallel with at least a

portion of said air passageway, said spine formed of a material which is rigid relative to the plastic material of said airway member, said spine being sufficiently flexible to conform with said airway member to said specific patient airway during insertion, and sufficiently rigid to maintain said configuration after insertion.

4,919,127

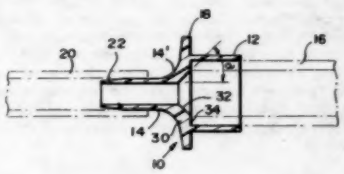
ENDOTRACHEAL TUBE CONNECTOR

Donald M. Pell, 861 Sixth Ave. S., St. Petersburg, Fla. 33701

Filed May 3, 1988, Ser. No. 189,714

Int. Cl.[5] A61M *16/00*

U.S. Cl. 128—207.14 **8 Claims**



1. A connector for connecting an endotracheal tube to a source of gas, comprising an annular gas inlet and an annular gas outlet sharing a common longitudinal axis with said inlet and extending downstream therefrom; said inlet having an inside diameter which is about 2½ to 3 times greater than the inside diameter of said outlet and adapted to receive a flexible tube having an outside diameter which is approximately the same as the inside diameter of said inlet therein, and an intermediate portion between said inlet and said outlet defining a radially flared outwardly extending annular passageway sharing a common longitudinal axis with said inlet and said outlet and connecting said inlet and said outlet with the smaller end of said radially flared passageway adjacent to the inside of said outlet, means to minimize turbulence and thereby reduce the work of breathing including a shoulder adjacent to the larger end of said radially flared passageway, said shoulder having a width approximately equal to the wall thickness of the flexible tube, so that, when the flexible tube is inserted into the inside of said inlet with its end abutting said shoulder, the outer edge of the large end of said radially flared passageway is flush with the interior passage provided by the flexible tube to thereby provide a smooth relatively unobstructed flow of gas through the tube and the connector, and a patient end portion of said outlet sharing a common longitudinal axis with said cylindrical outlet means and extending downstream therefrom, said patient end portions having a tapered outside diameter terminating at a thin circular leading edge so that one end of an endotracheal tube which extends outside of the patient can be forced over the tapered portion of the outlet to provide a

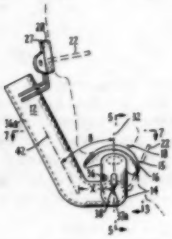
relatively smooth obstruction free passageway from and through the connector to the endotracheal tube whereby the work of inspiration by an intubated patient is minimized.

4,919,128

NASAL ADAPTOR DEVICE AND SEAL

John A. Kopala, and John E. Remmers, both of Calgary, Canada, assignors to University Technologies International Inc., Alberta, Canada

Filed Aug. 26, 1988, Ser. No. 236,941
Int. Cl.[5] A61M *15/00, 16/06*
U.S. Cl. 128—207.18 **20 Claims**



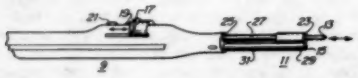
12. A nasal adaptor seal comprising a pair of flexible flange members, each having a curved surface and each having a portal therethrough for supplying air to the nasal airways, the portals being positioned to correspond to the nasal openings, the axis of each portal being positioned to substantially align with the aerodynamic air flow into and out of the nasal airways, said curved surfaces being complementary and conformed to the nares of an individual upon contacting the nares of an individual under sufficient force to form a seal between the flange members and the nares and without cannulating such nares, the perimeter of said surfaces generally corresponding to a projection of the external meatus of the nares of an individual.

4,919,129

EXTENDABLE ELECTROCAUTERY SURGERY APPARATUS AND METHOD

Jaroy Weber, Jr., Woodside; Terrance L. Kloeckl, San Francisco; Michael A. Cast, Palo Alto, and Frank T. Watkins, III, Menlo Park, all of Calif., assignors to Celebration Medical Products, Inc., Palo Alto, Calif.

Filed Nov. 30, 1987, Ser. No. 125,652
Int. Cl.[5] A61B *17/39*
U.S. Cl. 606—42 **7 Claims**



1. Surgical apparatus comprising:

an elongated body having an electrical conductor positionable along a slideable path extending substantially therethrough toward a forward end thereof, and including connector means disposed near said forward end;

said connector means being disposed to receive a conductive element therein for selective slideable positioning thereof relative to said forward end in response to slideable movement of the electrical conductor;

slider means disposed on the body and coupled to the electrical conductor for selectively altering the position thereof and of the connector means between forward and rearward positions thereof relative to said forward end;

circuit means disposed in the body to be actuated by the electrical conductor for controlling the application of electrical signal thereto in response to the position of the electrical conductor along the slideable path thereof;

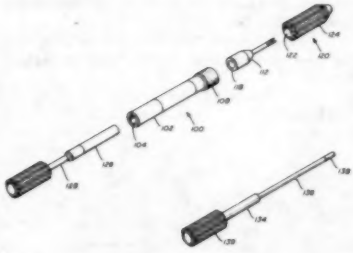
said circuit means including an interlock switch operable in conductive state and in non-conductive state and disposed to be actuated for operation in the non-conductive state in response to the electrical conductor being positioned near said rearward position along the slideable path thereof; said interlock switch including auxiliary circuit means disposed in the body for grounding the electrical conductor during operation in said non-conductive state.

4,919,130

TOOL FOR INSERTING COMPRESSIBLE INTRAOCULAR LENSES INTO THE EYE AND METHOD

Michael A. Stoy, Redmond; Vaclav Dusek, Renton; Anilbhai S. Patel, Seattle, all of Wash., and Ray G. Herriott, Grand Island, Nebr., assignors to Nestle S.A., Switzerland

Continuation-in-part of Ser. No. 928,057, Nov. 7, 1986, abandoned. This application Nov. 2, 1987, Ser. No. 115,231
Int. Cl.[5] A61B *17/00*
U.S. Cl. 606—107 **48 Claims**



41. A method of preparing an intraocular lens formed of a compressible material for insertion into an eye, comprising the steps of:

(a) providing a loading chamber, a cannula having a proximal end communicating with said loading chamber and an opposite distal end, an extruding means for extruding a compressible intraocular lens from said loading chamber into said cannula including a first resilient pushing means for cooperating with the walls of the loading chamber to compress the lens to a smaller size as the lens is extruded, and an ejecting means for ejecting the extruded lens out said distal end including a second resilient pushing means,

(b) positioning a compressible intraocular lens into said loading chamber,

(c) extruding with said extruding means said lens from said loading chamber into said cannula through said proximal end.

4,919,131

RESECTOSCOPE WITH IMPROVED GUIDE BLOCK AND ELECTRICAL PLUG CONNECTION

Benedetto Grossi, Stamford, and Thomas W. Bracci, Norwalk, both of Conn., assignors to Circon Corporation, Santa Barbara, Calif.

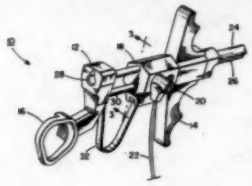
Filed Jun. 2, 1988, Ser. No. 202,154
Int. Cl.[5] A61B *17/36*
U.S. Cl. 606—46 **4 Claims**

1. A urological endoscope comprising:

frame means; and

guide block means, said guide block means being movably mounted on said frame means and comprising at least one guide bar channel, an electrode proximal end channel and

an electrical plug channel, said electrical plug channel having a first entry on a first lateral side and a second entry on a second lateral side, said electrical plug channel extending through said guide block means between said entries and intersecting said electrode channel, said guide block means further comprising means for limiting insertion of an electrical plug into said electrical plug channel to at least two orientations on each of said sides whereby



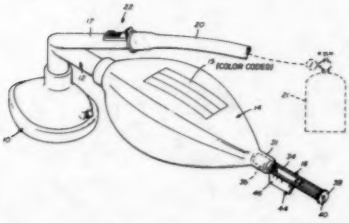
an electrical plug can be directly connected to an electrode by mounting the plug in said electrical plug channel on either said first or second side of said block to accommodate either a left or right handed operator an in at least either a first or second orientation on either of said first or second sides for allowing an operator to configure the connection of a plug to said guide block means for allowing an operator to feel comfortable and confident with the endoscope.

4,919,132

APPARATUS FOR SUPPLYING GAS TO A PATIENT

Martin G. Miser, Star Rte. 3, Box 5498, Pagosa Springs, Colo. 81147

Continuation of Ser. No. 88,128, Aug. 21, 1987, abandoned. This application Jun. 12, 1989, Ser. No. 366,233
Int. Cl.[5] A61M *16/00*
U.S. Cl. 128—205.17 **6 Claims**



1. Apparatus for administering a predetermined gas to a patient comprising:

a main gas conduit adapted to be connected to a face mask;

a flexible gas reservoir bag having one end connected to said main gas conduit and adapted to be manually squeezed for supplying gas to said patient;

first valve means connected to the other end of said gas reservoir bag and in fluid communication with the interior of said gas reservoir bag, said valve means including a vent to atmosphere and a valve member selectively movable between predetermined positions relative to said vent for controlling the flow of gas through said vent;

means adjacent said first valve means to permit upon squeezing of said reservoir bag an indication of the internal fluid pressure of said reservoir bag corresponding to said positions of said valve member relative to said vent;

a branch gas supply conduit having one end connected to said main gas conduit and adapted to supply a predetermined gas to said main gas conduit;

second valve means associated with said branch conduit for permitting the introduction of air into said branch conduit to dilute said predetermined gas, said second valve means including a vent to atmosphere and a slidable valve member over said vent selectively movable longitudinally of said branch conduit relative to and adjacent said vent; and

means adjacent said second valve member for indicating the position of said valve member over said vent and the relative dilution of said predetermined gas corresponding to said positions of said valve member.

4,919,133

CATHETER APPARATUS EMPLOYING SHAPE MEMORY ALLOY STRUCTURES

Tien-Hon Chiang, 63 Finisterra, Irvine, Calif. 92714

Filed Aug. 18, 1988, Ser. No. 233,417
Int. Cl.[5] A61B *17/32*
U.S. Cl. 606—159 **14 Claims**

1. An improved catheter, the catheter of the type used in a human artery for removing an arterial blockage therein using a mechanical or electromechanical or electro-optical plaque removal device such as a rotating blade within a cylindrical housing adjacent an opening through the radial wall of the housing, the rotating blade cutting pieces of plaque which are received and temporarily stored in the housing; the improvement comprising:

in said housing an integral, expandable wall portion positioned substantially opposite to said opening and being formed of a mesh of shape memory alloy wire responsive to changes in temperature for selective changes in dimension;

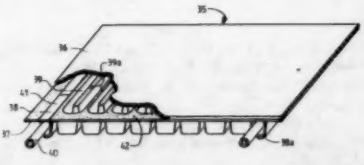
means for remotely controlling the temperature of said mesh wire for selectively expanding and contracting said wall portion while said catheter is in said artery.

4,919,134

THERMOELECTRIC CHILLER AND AUTOMATIC SYRINGE

James M. Streeter, Highland, Utah, assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Continuation of Ser. No. 80,524, Jul. 31, 1987, abandoned. This application Mar. 2, 1989, Ser. No. 318,490
Int. Cl.[5] A61F *7/00*
U.S. Cl. 128—400 **9 Claims**



1. A thermoelectric device for rapidly changing injectate temperature in a cardiac output thermodilution catheter system wherein a bolus of an injectate passes through a heat exchanger comprising;

a thermoconductive means made of an energy conductor having a pair of major surfaces one of which surfaces is shaped to exchange energy and definitively configured to mount in intimate and maximum surface contact with a source of heating or cooling energy having a complimen-

tary configuration for contact with the definitively configured major surface, the contact for uniform, rapid and efficient heat transfer through the thermoconductive means, and

fluid path means made of a material more resistant to heat transfer and less conductive than the energy conductor of the thermoconductive means and associated with said other surface of said thermoconductive means to define a tortuous passageway thereacross for providing contact with the bolus during its passage prior to injection and for maintaining the bolus in intimate heat transfer relation with said thermoconductive means, the combination of said tortuous passageway and said thermoconductive means sufficient to change the temperature of the injectate bolus volume.

4,919,135

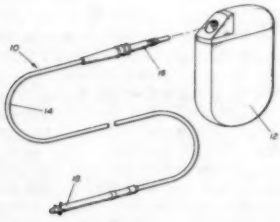
TRIAXIAL ELECTRODE

Richard E. Phillips, Jr., San Marcos, and Paul R. Spehr, Lake Jackson, both of Tex., assignors to Intermedics, Inc., Angleton, Tex.

Filed Dec. 14, 1988, Ser. No. 284,106

Int. Cl.[5] A61N *1/00*

U.S. Cl. 128—419 P **24 Claims**



1. A cardiac pacing lead assembly comprising:

electrode means defining a longitudinal axis and a tip portion provided with an exposed surface having at least one groove extending perpendicular to said longitudinal axis therein, said groove having a linear nadir portion, said tip portion being electrically adapted to be coupled with excitable cardiac tissue of a heart when said lead assembly is implanted in a patient for stimulating the cardiac tissue when said electrode means is electrically energized; and

electrical conductor means electrically connected at one end thereof to said electrode means for delivering electrical energy thereto, said conductor means having terminal means at the other end for connection to a pulse generator of a cardiac pacemaker.

4,919,136

VENTILATION CONTROLLED RATE RESPONSIVE CARDIAC PACEMAKER

Eckhard Alt, Eichendorffstrasse 52, 8012 Ottobrunn, Fed. Rep. of Germany

Filed Sep. 28, 1988, Ser. No. 250,060

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1987, 3732640

Int. Cl.[5] A61N *1/00*

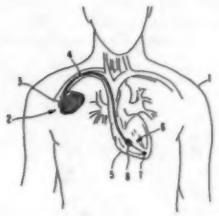
U.S. Cl. 128—419 P **12 Claims**

1. Heart measurement instrumentation comprising in combination,

measurement means for producing a measurement signal responsive to intracardiac pressure and volume of a patient,

processing means for the measurement signal including means for isolating from the measurement signal separate ventilatory function signals displaying variable amplitude and respiratory rate related to respiratory activity of a patient, and

tidal volume detection means for processing the amplitude



of the ventilatory function signals as a function of the respiratory rate to produce a corrected amplitude reflecting the true ventilatory tidal volume of the patient over a wide range of patient activity.

4,919,137

CARDIAC PACEMAKER WITH PHYSIOLOGICAL CONTROL

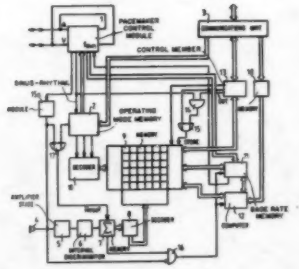
Max Schaldach, Erlangen, Fed. Rep. of Germany, assignor to Biotronik, Mess- und Therapiegeräte GmbH & Co. Ingenieurbüro Berlin, Berlin, Fed. Rep. of Germany

Filed Feb. 24, 1986, Ser. No. 832,004

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1985, 3506791

Int. Cl.[5] A61N *1/36*

U.S. Cl. 128—419 PG **17 Claims**



1. A cardiac pacemaker implantable in a patient, comprising:

means for applying stimulating pulses to the heart of the patient;

means for detecting at least one physiological parameter which is a function of left-ventricular systolic time intervals of the heart, and a first decoder means which receives a signal from said means for detecting at least one physiological parameter;

operating mode memory means, and a second decoder means which receives signals from said operating mode means;

memory means for storing a table of references values representing respective intervention frequency values which are retrievable as a function of both a signal from said operating mode means via said second decoder means and a signal representing said at least one physiological parameter from said means for detecting via said first decoder means;

control module means for supplying an operating mode signal and a sinus signal to said operating mode memory

means, said operating mode signal corresponding to one of a plurality of operating modes which include a mode of spontaneous cardiac action and a mode of stimulated cardiac action;

communication means for selectively supplying an external signal to said operating mode memory means for selectively inputting to said operating mode memory means a signal corresponding to a physiological control mode;

circuit means connected to said detecting means for deriving a reference value from said memory means which is a function of said at least one physiological parameter detected by said means for detecting; and

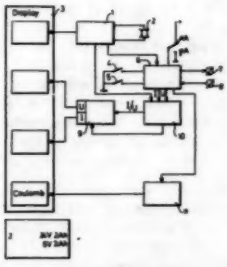
signal means connected between said circuit means and said means for applying stimulating pulses for producing stimulating pulses at a rate based on the reference value derived by said circuit means in the absence of spontaneous heart action.

4,919,138

METHOD AND APPARATUS FOR SUPPLYING ELECTRIC ENERGY TO BIOLOGICAL TISSUE FOR SIMULATING THE PHYSIOLOGICAL HEALING PROCESS

Björn Nordenström, Barrtorpsvägen 9, S-144 00 Rönninge, Sweden

Filed Nov. 14, 1988, Ser. No. 272,646
Claims priority, application Sweden, Nov. 13, 1987, 8704456
Int. Cl.[5] A61N 1/00
U.S. Cl. 128—421 **22 Claims**



1. Apparatus for supplying electric energy to biological tissue for supporting different physiological processes and for influencing viability conditions, comprising;

at least two electrodes, a first of said at least two electrodes being adapted to be disposed in or on the biological tissue which is to be supported in a physiological or pathophysiological cycle, and a second of said at least two electrodes being adapted to be disposed in spaced-apart relationship from said first of said at least two electrodes the biological tissue in such a position that electrically conducting circuits exist between said at least two electrodes;

a voltage source coupled to said at least two electrodes for supplying electric current through said biological tissue; and

control means coupled to said voltage source for supplying to said electrodes a current whose amplitude values alternate with time for simulating a physiological healing process, said current having successive maximum amplitude values such that each maximum amplitude value of said current is lower in absolute terms than the immediately preceding maximum amplitude value; and

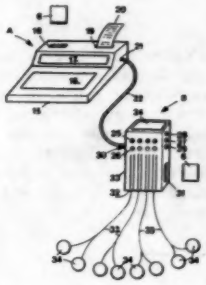
said control means causing said alternation of said current to take place a plurality of times within a cycle time interval which lies between 0.1 and 10 days.

4,919,139

ELECTRICAL NEUROMUSCULAR STIMULATION DEVICE

Roland Brodard, Villeneuve, Switzerland, assignor to Medicomex S.A., Geneva, Switzerland

PCT No. PCT/CH86/00040, § 371 Date Jan. 12, 1987, § 102(e) Date Jan. 12, 1987, PCT Pub. No. WO87/00760, PCT Pub. Date Feb. 12, 1987
PCT Filed Mar. 26, 1986, Ser. No. 345,660
Claims priority, application Switzerland, Apr. 3, 1985, 1438/85
Int. Cl.[5] A61N 1/00
U.S. Cl. 128—421 **5 Claims**

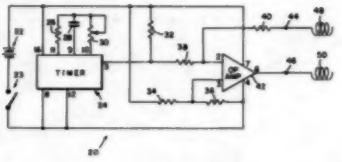


1. A device for electrical neuromuscular simulation in order to cause muscle contractions and muscle exercise or training, comprising at least one autonomous portable stimulating unit (B) controlled by a removable and interchangeable information storage medium (6) programmed beforehand by a therapist by means of a programming unit (A) according to the treatment of a patient in question, for supplying trains of electrical stimulating pulses at its output, which is equipped with at least one pair of electrodes (34) to be applied to that part of the patient's body which is to be treated wherein the stimulating unit (B) comprises means for generating trains of electrical pulses whose characteristics are matched to the slow muscle fibers of the patient's body, and other trains of electrical pulses whose characteristics are matched to the two known types of quick fibers of the patient's body, wherein said stimulating unit comprises program-actuated means (9) for carrying out, under the control of a sequential program recorded on the removable information storage medium (6), a muscle treatment by said trains of electrical pulses; means for regulating the frequency and the durations of the pulses of said trains of electrical pulses, according to the characteristics of the muscles treated and of the patient, and wherein the stimulating unit (B) comprises intensity regulating means, controlled by a microprocessor and capable of being actuated by the patient, for regulating the intensity of the stimulation within predetermined programmed limits; safety means, incorporated in the same microprocessor, for maintaining the variation of the muscular contraction force to he substantially linear as a function of time, and for preventing an increase of the current intensity of the stimulating pulses to occur outside a predetermined plateau period (b) of the muscle contraction work phase, and for imposing, between at least those pulse trains intended for the quick fibers, a sufficient delay time (c) to avoid any harmful effects to said both types of fibers, so as to enable a treatment to last several hours without such harmful effects.

4,919,140
METHOD AND APPARATUS FOR REGENERATING NERVES

Richard B. Borgens, Delphi, and Michael E. McGinnis, West Lafayette, both of Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed Oct. 14, 1988, Ser. No. 258,142
Int. Cl.[5] A61N 1/00
U.S. Cl. 128—422 11 Claims

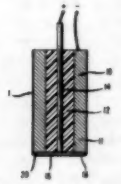


1. A method for stimulating nerves in the central nervous system of a mammal to regenerate within the central nervous system comprising the step of applying an oscillating electrical field to the spinal cord wherein the electrical field's polarity reversal period is less than about sixty minutes which is less than a die back period of anodally facing axons in the central nervous system and more than about thirty seconds which is long enough to stimulate growth of cathodally facing axons in the central nervous system.

4,919,141
IMPLANTABLE ELECTROCHEMICAL SENSOR

Horst D. Zier, Amstetten; Wolfgang Kerner, Dornstadt-Bollingen, and Ernst F. Pfeiffer, Ulm, all of Fed. Rep. of Germany, assignors to Institute für Diabetestechnologie Gemeinnützige Forschungs- und Entwicklungsgesellschaft mbH, Ulm, Fed. Rep. of Germany

Filed Jan. 4, 1988, Ser. No. 140,476
Claims priority, application Fed. Rep. of Germany, Jan. 3, 1987, 3700119
Int. Cl.[5] A61B 5/00
U.S. Cl. 128—635 15 Claims

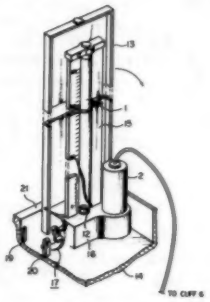


1. Implantable sensor for amperometric measurements in body liquids, such as blood or tissue liquid, comprising
a measurement electrode;
a reference electrode tubularly surrounding the measurement electrode and made of a stainless steel containing molybdenum as an alloy component; and
a layer of an immobilized enzyme being disposed on at least one end of the electrodes,
wherein said at least one end is adapted for insertion into a body liquid.

4,919,142
MECHANISM FOR OPENING AND CLOSING MERCURY SPHYGMOMANOMETER

Tsuchiyasu Yokozuka, Fujioka, Japan, assignor to Yamasu Co., Ltd., Saitama, Japan

Filed Jan. 4, 1989, Ser. No. 293,409
Claims priority, application Japan, Aug. 31, 1988, 63-217569
Int. Cl.[5] A61B 5/02
U.S. Cl. 128—684 3 Claims

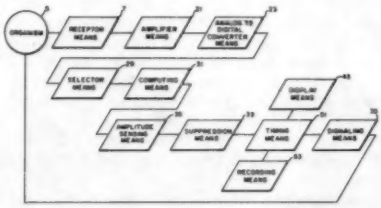


1. A mercury sphygmomanometer having a set of blood pressure measuring means mounted on the inner side of a cover pivotally attached to a cover of a casing and a lever actuated in response to an operation of pivoting said cover such that said lever selects an opening or closing position of a valve provided in between a mercury passage and a mercury reservoir in response to a operation of pivoting said cover, said lever comprising:
means for opening and closing said valve which has two abutments provided on said lever, said two abutments being disposed in a predetermined angular relation to each other with respect to the pivot point of said lever, one of said abutments being movable by a manual operation to select a valve opening or closing position.

4,919,143
ELECTROENCEPHALIC NEUROFEEDBACK APPARATUS AND METHOD FOR BIOELECTRICAL FREQUENCY INHIBITION AND FACILITATION

Margaret E. Ayers, 10623 Bloomfield, Tolnca Lake, Calif. 91602

Filed Jun. 14, 1989, Ser. No. 365,717
Int. Cl.[5] A61B 5/0482
U.S. Cl. 128—732 8 Claims



1. An improved apparatus for inhibiting or producing analog bioelectrical signal frequencies in a person's body comprising:
(a) receptor means for attachment to the person's body at a location emitting an analog bioelectrical signal of interest;
(b) amplification means for amplifying said analog bioelectrical signal received from said receptor means, said receptor means conveying said analog bioelectrical signal to said amplification means;

(c) analog to digital converter means for converting said analog bioelectrical signal to digital signal representing particular analog frequencies, said analog signal having been amplified is converted to discrete digital signal representing corresponding analog frequencies;

(d) selecting means to select a particular digital signal, said selecting means including a numerical analyzer receiving said discrete digital signals allowing the selection of a particular digital signal corresponding to a particular analog bioelectrical frequency to be inhibited or accentuated and avoiding the delay and distortion of power spectral and bandpass analysis; and

(e) sensation means for giving the person a particular sensation when said particular digital signal is maintained within predetermined ranges of amplitude for a predetermined duration, thereby allowing the person to mentally concentrate so as to inhibit or produce said particular analog bioelectrical signal frequency which can be acknowledged by the person when the person receives said sensation.

4,919,144

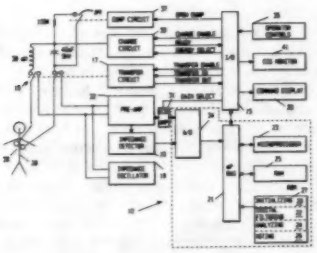
DEFIBRILLATOR ECG INTERPRETER

Marvin E. Vandehey, Seattle, Wash., assignor to First Medic, Bellevue, Wash.

Filed Feb. 26, 1988, Ser. No. 161,062

Int. Cl.[5] A61B *5/04*

U.S. Cl. 128—705 **30 Claims**



1. A system for detecting ventricular fibrillation and high rate ventricular tachycardia in a single-channel electrocardiogram produced in a pair of electrodes connected to a patient, comprising:

input means for receiving a sequence of digitized ECG samples of the ECG;

storage means for storing the sequence of digitized ECG samples received through the input means;

processing means for analyzing said sequence of ECG samples to discriminate among (1) noise, (2) ventricular fibrillation or high rate ventricular tachycardia that should be defibrillated, and (3) QRS peaks associated with ventricular contraction that should not be defibrillated; and

output means connected to the processing means for indicating when the processing means detects ventricular fibrillation or high rate ventricular tachycardia.

4,919,145

METHOD AND APPARATUS FOR SENSING LEAD AND TRANSTHORACIC IMPEDANCES

Arthur R. Marriott, Seattle, Wash., assignor to Physio-Control Corporation, Redmond, Wash.

Filed Jul. 13, 1988, Ser. No. 219,080

Int. Cl.[5] A61B *5/08*

U.S. Cl. 128—723 **18 Claims**

1. An apparatus for use with medical diagnostic and therapeutic apparatus employing electrodes attached to a patient's skin for sensing the integrity of lead connections and patient transthoracic impedance comprising:

(a) a carrier signal source means coupled to a first lead having a first lead impedance and coupled to a plurality of second leads having a plurality of second lead impedances:

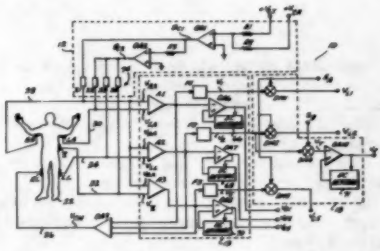
(i) for producing a first carrier signal having a lead impedance frequency component and an impedance respiration frequency component and for applying said first carrier signal to said first lead; and,

(ii) for producing a second carrier signal having said lead impedance frequency component and said impedance respiration frequency component and for applying said second carrier signal to said plurality of second leads;

(b) a receiver means coupled to said first lead and said plurality of second leads for receiving:

(i) a first lead voltage produced by said first carrier signal and said first lead impedance; and,

(ii) a plurality of second lead voltages produced by said second carrier signal and said plurality of second lead impedances;



(c) amplifying means, coupled to receive a plurality of combinations of said first lead voltage with one of said plurality of second lead voltages, for amplifying the difference between said first and second lead voltages in each of said combinations and producing;

(i) a plurality of first stage output voltages, one of said first stage output voltages being produced for each of said combinations of said first and second lead voltages; and,

(ii) a plurality of second stage output voltages, one of said second stage output voltages being produced for each of said combinations of said first and second lead voltages; and,

(d) a signal separator means coupled to said amplifying means for receiving said plurality of first stage output voltages and for producing:

(i) a plurality of lead impedance-related voltages related to said lead impedance frequency component of said first and second carrier signals; and,

(ii) at least one impedance respiration-related voltages related to said impedance respiration frequency component of said first and second carrier signals.

4,919,146

BIOPSY DEVICE

Edward Rhinehart, Monroeville; James E. Machek, Bradfordwoods, and Michael W. Sanctis, Pittsburgh, all of Pa., assignors to Medrad, Inc., Pittsburgh, Pa.

Filed Oct. 25, 1988, Ser. No. 261,746

Int. Cl.[5] A61B *10/00*

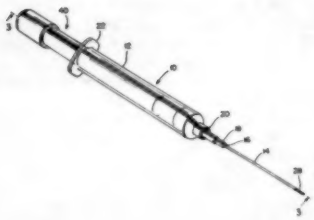
U.S. Cl. 128—752 **25 Claims**

1. A device for obtaining biopsy samples, said device comprising:

a housing having proximal and distal ends and a distal tip terminating the distal end, a cannula having proximal and

distal ends mounted at the distal end of said housing, the distal tip of said housing being open;

a drill bit/plunger component slidably mounted in said housing, said drill bit/plunger component including a plunger and a drill bit having proximal and distal ends with a cutting tip at the distal end of said drill bit, said drill bit extending through said plunger in a fluid-tight seal, said drill bit/plunger component being sized to fit within said housing such that when said drill bit/plunger component is inserted in said housing, said drill bit passes through said



cannula and such that when said plunger abuts the distal end of said housing, said cutting tip extends beyond the distal end of said cannula,

a rotational energy element for providing rotational energy to said drill bit/plunger component,

coupling means for coupling said rotational energy element to said drill bit/plunger component, and

means for actuating said rotational energy element so as to impart rotational movement to said coupling means and said component.

4,919,147

ESOPHAGUS PROBE

Josef Reinhardt, Krozingerstrasse 10, D-7801 Ehrenkirchen, and Martin Rösale, Hauptstrasse 71, D-7800 Freiburg, both of Fed. Rep. of Germany

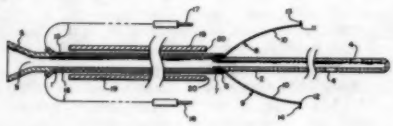
PCT No. PCT/DE87/00486, § 371 Date Jun. 1, 1988, § 102(e) Date Jun. 1, 1988, PCT Pub. No. WO88/03034, PCT Pub. Date May 5, 1988

PCT Filed Oct. 27, 1987, Ser. No. 221,457

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1986, 3636489

Int. Cl.[4] A61N *1/05*

U.S. Cl. 128—785 **14 Claims**



1. An apparatus for stopping esophageal bleeding, comprising:

an esophageal probe with a first tubus adapted for advancing into the espohagus of a patient;

an electrode pair arranged on said first tubus, said electrode pair including at least one sharp point projecting outwardly of said first tubus;

a means for penetrating a mucous membrane of the esophagus by urging said at least one point into the membrane; and

a stimulating current means for delivering an electrical stimulating current to said at least one point.

4,919,148

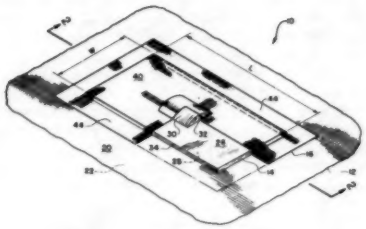
APPARATUS AND METHOD FOR TRANSCUTANEOUS ELECTRICAL STIMULATION

Philip E. Muccio, 753 Quilliams Rd., South Euclid, Ohio 44121

Filed Jun. 13, 1988, Ser. No. 218,710

Int. Cl.[5] A61N *1/04*

U.S. Cl. 128—798 **17 Claims**



1. A garment for transcutaneous neural stimulation comprising:

a non-conductive, knit fabric material defining a first layer;

at least one flexible, generally flat electrically conductive electrode having an upper surface and a generally planar lower surface in confronting relationship with said fabric material, said electrode connectable to a source of electrical stimulation;

a second layer of a non-conductive material overlying the upper surface of said electrode, said second layer dimensioned such that a portion thereof extends a predetermined distance beyond the periphery of said electrode;

a layer of adhesive material disposed between said second layer and said first layer for securing said second layer to said first layer, said electrode being confined between said first layer and said second layer wherein a generally flat pocket to receive a conductive fluid is defined between said first layer and said lower surface of said electrode;

said adhesive layer securing said first layer to said second layer defining a boundary around the entire periphery of said electrode for preventing migration of said conductive fluid beyond the periphery of said electrode.

4,919,149

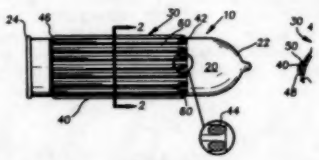
CONTRACEPTION AND FLAVOR DELIVERY SYSTEM

Michael A. Stang, 26 Stockmill Rd., Apt. F, Pikesville, Md. 21208

Filed Jul. 8, 1988, Ser. No. 216,351

Int. Cl.[5] A61F *5/00, 5/42, 5/44*

U.S. Cl. 128—842 **18 Claims**



1. A contraception and flavor delivery system, comprising:

a prophylactic element for at least partial insertion into a bodily orifice defining an extended tubular member, said tubular member having a closed distal end and an open proximal end for encompassing at least a portion of a male genital member; and,

flavor delivery means formed on an external surface of said tubular member, said flavor delivery means adapted for

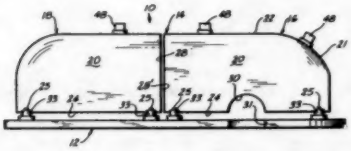
dispensing an ingestible composition having a predetermined taste into said bodily orifice, said flavor delivery means including at least one tubular housing formed on said tubular member having an open first end and a closed second end, said tubular housing including closure means coupled to said open first end for releasing said ingestible composition responsive to an external stimuli.

4,919,150

INTRAVENOUS CATHETER SHIELD AND RETAINER

Michael L. Grant, P.O. Box 95744, Oklahoma City, Okla. 73143

Filed Jun. 26, 1989, Ser. No. 378,359
Int. Cl.[5] A61M *5/00*
U.S. Cl. 128—877 **2 Claims**



1. A shield for protecting the position of an intravenous needle having a supply tube connected at one end thereto when the needle is inserted in a body part of a patient, comprising:

an elongated generally rectangular planar base for underlying the terminal end portion of a patient's limb,

said base having a plurality of elongated slots adjacent opposing longitudinal side edges;

flexible means for securing said base to the patient's limb in an immobilizing manner,

said flexible means including,

a like plurality of elongated straps respectively extending through said plurality of slots and surrounding a portion of said base and patient's limb thereon, each strap of said plurality of straps having opposing end portions disposed in overlapping relation;

self-adhering fabric material cooperatively secured to said strap opposing end portions for releasably joining said end portions together;

a rigid inverted open end channel-like transparent housing substantially U-shape in transverse cross section having coextensive depending leg portions and an arcuate bight portion longitudinally overlying the base in laterally and vertically spaced relation with respect to the surface of the patient's limb and an intravenous needle position;

means releasably securing the housing leg portions to respective side edge portions of said base,

said housing releasable means including,

an upstanding pin adjacent respective opposing longitudinal side edges of said base and, a vertically apertured lug adjacent the depending limit of the housing respective leg portion for cooperative frictional reception of said pin; and,

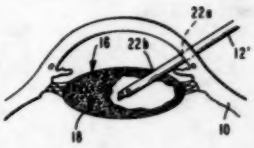
spring clamp means on said housing for securing one end portion of a needle supply tube to said housing.

4,919,151

SYNTHETIC POLYMER FOR ENDOCAPSULAR LENS REPLACEMENT

Robert H. Grubbs, South Pasadena, Calif.; Robert J. Coots, Sheffield Lake, Ohio, and Stanley H. Pine, South Pasadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Continuation of Ser. No. 70,060, Jul. 6, 1987, abandoned. This application Sep. 1, 1989, Ser. No. 403,833
Int. Cl.[5] A61B *19/00*
U.S. Cl. 128—898 **17 Claims**



1. A method of endocapsular lens replacement by forming a synthetic polymer in the lens capsule of an eye after removal of the lens comprising:

(a) injecting a polymer composition comprising a photo-sensitive prepolymer and a photoinitiator into said lens capsule in the absence of oxygen;

(b) exposing said composition to light to form said synthetic polymer; and

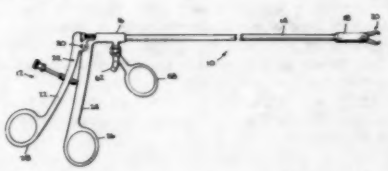
(c) curing said polymer within several minutes.

4,919,152

METHOD OF CLOSING THE OPENING OF A HERNIAL SAC

Ralph Ger, 16 Oaks Hunt Rd., Lake Success, N.Y.

Continuation of Ser. No. 20,555, Mar. 2, 1987, abandoned, which is a continuation of Ser. No. 815,659, Dec. 30, 1985, abandoned, which is a continuation of Ser. No. 525,125, Aug. 22, 1983, abandoned. This application May 18, 1988, Ser. No. 195,586
Int. Cl.[5] A61C *17/10*
U.S. Cl. 128—898 **14 Claims**



8. A method for closing the opening of a hernial sac having separated tissue portions in the groin area of a patient by inserting an instrument through an incision in the abdominal wall comprising the steps of:

making a small incision through the abdominal wall of the patient at a site in the abdomen which site is remote from the opening in said hernial sac in said groin area of the patient;

inserting an elongate instrument through said abdominal incision;

moving said instrument through said abdominal incision and through the internal body cavity of the patient so that the distal end of said instrument is close to the opening in said hernial sac in said groin area of the patient while remaining on an internal side of said abdominal opening;

gripping, approximating and holding together two pieces of body tissue on opposite sides of said opening in the hernial sac from said internal side of said abdominal opening, the composite step of gripping, approximating and holding being performed remotely from tissue edges with said

instrument by manual manipulation at a proximal end thereof; and

joining together said two pieces of body tissue from said internal side of said abdominal opening, said step of joining being performed with said instrument by manual manipulation at a proxinal end thereof.

4,919,153

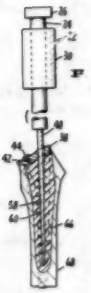
METHOD AND APPARATUS FOR REMOVING PRE-PLACED PROSTHETIC JOINTS AND PREPARING FOR THEIR REPLACEMENT

Albert K. Chin, Palo Alto, Calif., assignor to Origin Medsystems, Inc., San Mateo, Calif.

Filed Oct. 11, 1988, Ser. No. 255,650

Int. Cl.[5] A61F *5/04*

U.S. Cl. 606—93 **23 Claims**



1. A method for removing a prosthetic appliance secured in place by a mantle of hardened methylmethacrylate cement received within a bone cavity and conditioning the bone cavity for receipt of a new appliance, said method comprising:

(a) pulling the appliance from the mantle of hardened cement to leave a cement cavity within the mantle;

(b) injecting a fluid mass of methylmethacrylate cement into the cement cavity;

(c) inserting a post having an irregular exterior surface into the fluid mass of methtylemethacrylate cement;

(d) permitting said fluid mass of methylemethacrylate cement to harden and bond to the post and the hardened mantle; and,

(e) applying tension to the post to pull the post and the bonded mantle of methylemethacrylate cement from the bone cavity.

4,919,154

PIPE PURGING ASSEMBLY AND METHOD THEREFOR

Thomas B. Engle, 2135 Rosswood Dr., San Jose, Calif. 95124

Filed Feb. 29, 1988, Ser. No. 161,745

Int. Cl.[5] B08B *9/00, 3/00*

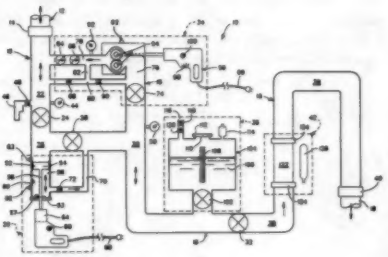
U.S. Cl. 134—22.12 **17 Claims**

1. A pipe purging assembly for purging fluid flow blockage from pipe systems comprising:

coupling means for attaching the assembly to the blocked pipe system such that fluid may flow freely between the device and the pipe system;

an internal tubing system within the assembly including at least serially connected first, second, third and fourth cavities, each of which is isolatible by way of user controllable valves, the tubing system culminating at one end thereof with the coupling means and culminating at the other end thereof in outlet means for permitting fluid to flow therethrough out of the device to a destination separate from the blocked pipe system; and

a hydraulic shock producing subassembly attached to the tubing system for delivering repeated controlled hydraulic shocks to fluid contained within the tubing system; wherein



a backpump subassembly is provided to interconnect said third cavity to said first cavity, bypassing said second cavity, said backpump subassembly being utilized to pump fluid into the pipe system.

4,919,155

HAIR CLIP

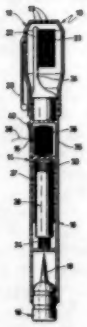
Masahiro Yasuda, 22-6, Daireminami 1-chome, Higashi Osaka-shi, Osaka, Japan

Filed Mar. 8, 1989, Ser. No. 320,565

Claims priority, application Japan, Mar. 11, 1988, 63-58695

Int. Cl.[5] A45D *8/28*

U.S. Cl. 132—278 **6 Claims**



1. A hair clip comprising:

a base plate including a pair of brackets at one end and a pair of ledges at the other end;

a hair retainer rotatably connected to the brackets at one end, said hair retainer having an engaging portion at the other end;

a pair of arms projecting inwards from the insides of the ledges, each arm including a leg portion capable of overlapping with the leg portion of the other arm;

said engaging portion including a central dented part and a pair of arched bridge parts at opposite sides of the dented part; and

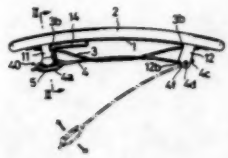
a ring placed between the central dented part and the arched bridge parts, said ring having a central opening for allowing the leg portions of the arms to fit in when they overlap with each other for unlatching.

4,919,156

COMBINATION DENTAL DEVICE

Samuel D. Gipson, 2344 Park Ave., Memphis, Tenn. 38114

Filed May 15, 1989, Ser. No. 351,535
Int. Cl.[5] A45D *44/18*
U.S. Cl. 132—309 **1 Claim**



1. A combination dental device having a toothbrush, a dental floss supply and dispenser, a dentifrice supply and dispenser, and an interdental gum stimulator all within a structure resembling a traditional fountain pen case, said dental device comprising:

a removable cap having a pocket clip thereon and ventilation holes therein;

an upper cylindrical section having a top end adapted to receive said removable cap; a bottom end; an integral sleeve therein which extends from a point within said upper cylindrical section to below said bottom end; an aperture and a door therefor permitting access to the interior of said upper cylindrical section; a hole adjacent said aperture; and a dental floss cutter mounted on said upper cylindrical section adjacent said aperture and said hole;

a toothbrush having bristles mounted at one end of a handle; said handle being mounted in said top end of are exposed at said top end and fit within said removable cap when said removable cap is positioned on said top end of said upper cylindrical section;

a dental floss dispenser having a supply of dental floss thereon rotatably mounted in said upper cylindrical section adjacent said aperture therein, whereby said dental floss may be threaded through said hole and cut on said cutter;

a cartridge for a supply of dentifrice, said cartridge having a cylindrical shape and being designed to fit within said sleeve in said upper cylindrical section whereby said cartridge when positioned in said sleeve is partly within and partly without said sleeve; said cartridge having a first opening and a cap therefor at one end to permit dentifrice to be admitted and a second opening and cap therefor at the other end to permit said dentifrice to be applied to said toothbrush;

a lower cylindrical section having a top end and a bottom end, said top end of said lower cylindrical section being designed to receive and form a releasable friction connection to said sleeve, whereby said dentifrice cartridge partly positioned in said sleeve extends into said lower cylindrical section;

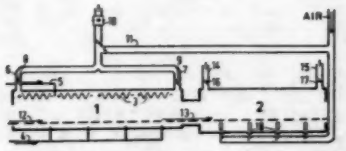
an elongated closure element having a flat surface at one end thereof and an interdental gum stimulator at the other end thereof, said closure element being capable of fitting within said bottom end of said lower cylindrical section is either of two positions, a first position whereby said flat surface faces outwardly from said lower cylindrical section and said interdental gum stimulator faces inwardly thereto and is concealed within said lower cylindrical section, and a second position whereby said flat surface faces inwardly and said interdental gum stimulator faces outwardly from said lower cylindrical section.

4,919,157

METHOD OF CLEANING METAL COMPONENTS FOR CATHODE RAY TUBES

Emil Mateias, Aachen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 240,403, Aug. 30, 1988, abandoned, and a continuation of Ser. No. 99,269, Sep. 2, 1987, abandoned. This application Jun. 14, 1989, Ser. No. 368,999
Claims priority, application Fed. Rep. of Germany, Nov. 20, 1986, 3639657
Int. Cl.[5] C23G *5/00*
U.S. Cl. 134—2 **7 Claims**



1. A method for cleaning a metal component for a cathode ray tube whereby oil present on the surfaces of the metal component is removed from these surfaces characterized in that:

(a) the metal component is heated at a temperature of less than 400° C. in an inert atmosphere to thereby evaporate oil from said surfaces;

(b) the surfaces are then oxidized by water vapor by heating the metal component in a weakly oxidizing atmosphere comprising 92 to 96% by volume of nitrogen, 4 to 8% by volume of hydrogen and water vapor in an amount such that the dew point is 25° C. to −10° C. at a temperature of 500° C. to 800° C.;

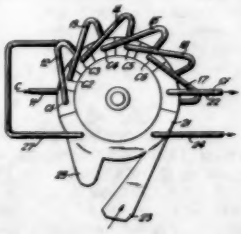
(c) and then reducing said oxidized surfaces by heating said metal component in a reducing atmosphere comprising 92 to 96% by volume of nitrogen, 4 to 8% by volume of hydrogen and water vapor in an amount such that the dew point of said reducing atmosphere is less than 0° C. at a temperature of 500° C. to 800° C.

4,919,158

METHOD AND APPARATUS FOR WASHING PULP

Seppo K. Kokkonen, and Harri T. Qvintus, both of Savonlinna, Finland, assignors to A. Ahlstrom Corporation, Karhula, Finland

Filed Mar. 20, 1987, Ser. No. 28,273
Claims priority, application Finland, Mar. 20, 1986, 861167
Int. Cl.[5] B08B *1/04, 3/02*
U.S. Cl. 134—15 **6 Claims**



1. A method of washing pulp utilizing a moving liquid-pervious support surface moving in a first direction past several successive washing stages, comprising the steps of:

(a) feeding the pulp onto the moving liquid-pervious support surface in a substantially continuous layer, which layer then moves in the first direction;

(b) supplying washing liquid to the pulp layer and passing the washing liquid through the layer in the several successive washing stages which each have at least two washing phases in a manner so that the washing liquid flows generally in a second direction which is opposite to said first direction; and wherein

step (b) is practiced by dividing the washing liquid into at least two partial flows which pass respectively through alternate washing phases in said second direction, the washing liquid of one flow which has passed through one washing phase passing at least the second washing phase preceding said one washing phase in said first direction.

4,919,159

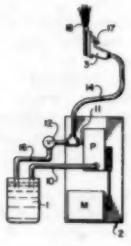
METHOD AND APPARATUS FOR CLEANING THE INTERIOR SURFACES OF BUILDINGS, AND ESPECIALLY CEILINGS OF OFFICE BUILDINGS

Robin J. Forrest, Toronto, and Russell C. Ward, King City, both of Canada, assignors to Ceiling Doctor International Inc., Toronto, Canada

Filed Jun. 29, 1988, Ser. No. 212,981

Int. Cl.[5] B08B 3/00

U.S. Cl. 134—22.18 **3 Claims**



1. A process for cleaning the interior surfaces of buildings including office ceilings, wherein a fine mist of cleaning liquid droplets is sprayed into said surfaces, said fine mist being produced by pumping said liquid from a container by means of a pump which leads to a delivery tube and which produces a pressure of at least 300 psi, and atomizing said liquid by means of a spray gun having a nozzle with an oval-shaped orifice having a breadth less than 0.020 inches and which produces a fan-type spray, said fan-type spray being capable of being directed by the spray gun upwardly onto ceiling surfaces, the relationship of pressure to nozzle size being such that the amount of liquid which passes through the nozzle is less than 0.20 gall/minute, wherein the amount of liquid passing through the pump is more than 5 times the amount passing through the nozzle with the remainder of the liquid being continuously returned via a bypass line to said container, the amount of liquid being sprayed and the fineness of the droplets being produced being such that very little dripping occurs.

4,919,160

SYSTEM FOR CLEANING WHIRLPOOL BATHS

Joseph B. Pierce, 1811 Old Shell Rd., Mobile, Ala. 36607

Filed Sep. 12, 1988, Ser. No. 243,278

Int. Cl.[5] B08B 9/02

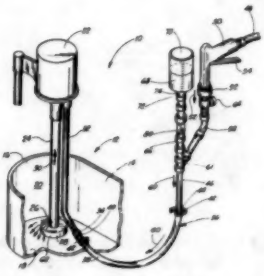
U.S. Cl. 134—100 **7 Claims**

1. A system for cleaning whirlpool baths, comprising:

(a) a fluid flow line, having a first end capable of introducing a flow of water under pressure thereinto, and a second end engageable onto a flow line of a whirlpool bath;

(b) a secondary flow line forming a juncture with the first flow line, the second flow line having an end portion for adaptably engaging a measured quantity of second fluid thereinto, so that the flow of second fluid may join the flow of water through the principal flow line and into the whirlpool bath;

(c) valving means for controlling the flow of fluid both in the principal flow line and the secondary flow line to obtain a certain ratio of mixture between the fluids in the two lines; and



(d) means for attaching the principal flow line to the outflow end of the whirlpool bath for flushing fluids in a reverse direction as in normal operations.

4,919,161

APPARATUS FOR REMOVING RESIDUES FROM PARTS OF PLASTICS PROCESSING MACHINES

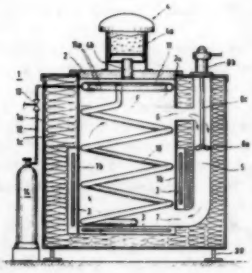
Rudolf Schmidt, Munich, Fed. Rep. of Germany, assignor to C. CHRIST Abgasfreie Werkzeugreinigungsapparate für die Kunststoffindustrie, Munich, Fed. Rep. of Germany

Filed May 19, 1989, Ser. No. 354,454

Claims priority, application Fed. Rep. of Germany, May 27, 1988, 3818144

Int. Cl.[5] B08B 3/08

U.S. Cl. 134—108 **11 Claims**



1. Apparatus for removing residues, especially plastic residues from parts of processing machines, comprising:

a vessel receiving the parts and having a closable top and a bottom, said vessel defining an interior containing a heat transfer fluid at a predetermined liquid level;

heating means for raising the temperature of said heat transfer fluid above a melting temperature of the plastic residues adhering to the parts;

filter means connected with said interior of said vessel for absorbing substances escaping from said interior of said vessel;

pump means for imparting a motion to said heat transfer

fluid, said pump means having a suction side connected to said interior in vicinity of said liquid level and a delivery side connected to said interior in vicinity of said bottom of said vessel; and

means for introducing an inert gas into said interior of said vessel above said liquid level of said heat transfer fluid.

4,919,162

DISHWASHER

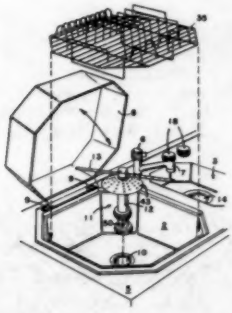
David Lumby, Kingsgrove, and Stephen Dawkins, Penshurst, both of Australia, assignors to McIlwraith Davey Pty. Ltd., Revesby, Australia

Filed Sep. 29, 1987, Ser. No. 102,339

Claims priority, application Australia, Sep. 29, 1986, PH8230

Int. Cl.[5] B08B *3/02*

U.S. Cl. 134—115 R **13 Claims**



1. A sink located dishwasher having a water supply means to supply water to the sink, a rack for dishes and utensils located in the sink, a drain located in the base of the sink, a cover for the sink, a water spray arm located above the base of the sink and removably mounted above said drain, water outlet means in communication with the drain to direct water to a pump, water inlet means located in said drain to direct water from said pump to said spray arm, the water inlet means being removably insertable into the drain, and a releasable obstruction included in said drain below said water outlet means.

4,919,163

DEVICE AND METHOD FOR FLUSHING FLUID LINES

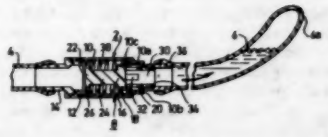
Peretz Rosenberg, Beit Shaareem, Israel

Filed Sep. 25, 1989, Ser. No. 411,985

Claims priority, application Israel, Jan. 10, 1989, 88916

Int. Cl.[5] F16K *51/00*

U.S. Cl. 137—15 **18 Claims**



12. A method of flushing out contaminants from a section of a line conveying a pressurized fluid, comprising:

attaching a container to the end of the line section via a valve assembly which, when the line section is depressurized, connects the interior of the container to the interior of the line section, and when the line section is pressurized, disconnects the interior of the container from the end of the line section and connects the interior of the container to the atmosphere;

and applying pressurized fluid to the line section first to cause the contaminants to be received within the container and the interior of the container to be pressurized, and then to disconnect the interior of the container from the line section and to connect it to the atmosphere, whereby the contents of the container are flushed out to the atmosphere.

4,919,164

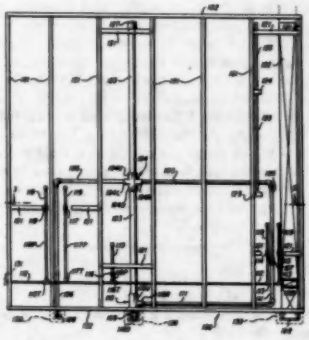
METHOD OF INSTALLING PIPING, DUCTS AND CONDUITS IN A PREFABRICATED FRAMED WALL FOR A BUILDING STRUCTURE AND PARTITION MADE THEREBY

Alexander Barenburg, 1305 W. Wolfram St., Chicago, Ill. 60657

Filed Feb. 23, 1989, Ser. No. 314,155

Int. Cl.[5] F16L *5/00*; E04H *1/00*

U.S. Cl. 137—15 **16 Claims**



1. A method of making a partition for a prefabricated framed wall to be mounted into a building structure under construction, said method comprising the steps of:

a. cutting at least one hole through each of a plurality of frame studs, a top frame plate, and a bottom frame plate;

b. aligning the plurality of frame studs to be oriented vertically and substantially parallel to each other;

c. securing tops of the plurality of frame studs to the top frame plate to be oriented horizontally;

d. securing bottoms of the plurality of frame studs to the bottom frame plate to be oriented substantially parallel to the top frame plate;

e. installing plumbing pipes between the plurality of frame studs, the top frame plate, and the bottom frame plate;

f. inserting a sanitary tee of the plumbing pipes through at least one hole cut in the bottom frame plate so that the sanitary tee depends therebelow for connection below a bathroom floor to one of a bathtub, a shower, and a toilet fixture; and

g. securing a removable box means for protecting the sanitary tee on an underside of the bottom frame plate so that the partition is ready to be shipped without damage to the sanitary tee depending below the bottom frame plate;

whereby a partition is made for a prefabricated framed wall to be mounted into a building structure under construction.

4,919,165

RAINFALL CONTROL FOR IRRIGATION SYSTEMS

Grover Lloyd, 509 W. Lee St., Osceola, Ark. 72370

Filed Jul. 7, 1989, Ser. No. 376,507
Int. Cl.[5] F16K *17/36*
U.S. Cl. 137—78.2 **20 Claims**

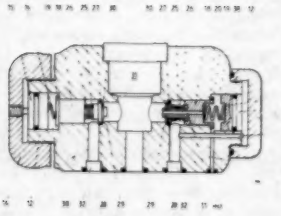
1. A control device for shutting off the motor which drives a pump for an irrigation system in response to a predetermined amount of rainfall thereby terminating the supply of water to at least one distribution outlet comprising a receptacle having upper and lower ends and side wall portions defining an enclosed chamber, an opening in said upper end of said receptacle, a float means disposed within said housing, mounting means for pivotally supporting said float means within said receptacle, said float means being pivotable from a first position to a second position as fluids are collected within said receptacle, securing means for selectively vertically adjusting the position of said mounting means with respect to said receptacle, first electrical switch means carried by said float means, electrical conductor means connecting said first electrical switch means to the motor, said first electrical switch means being operable when said float means is in said second position to shut down the motor to thereby prevent further operation of the pump in response to a predetermined accumulation of rain water within said receptacle.

4,919,166

TWO-WAY FLOW VALVE

Anthony M. Sims, Hindmarsh Rd, Murray Bridge, South Australia, Australia 5253

Filed Jun. 27, 1989, Ser. No. 372,838
Claims priority, application Australia, Jul. 5, 1988, PI9160
Int. Cl.[5] F16K *17/18*
U.S. Cl. 137—493 **8 Claims**



1. A two-way valve useful for inhibiting fluid flow in one direction while allowing it in a reverse direction, and vice versa, comprising:

a body having walls defining two cylinders; and

a pair of valve assemblies, each comprising a piston slidable in a respective cylinder, a spindle extending from one end of the piston, a metering valve member slidable on the spindle normally engaging a valve seat at one end of the relevant cylinder, abutment means on the spindle which engages the valve member and moves it away from the seat upon movement of the piston in one direction, and restraining means inhibiting that movement in that one direction;

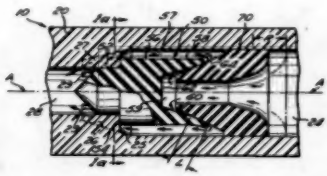
said body comprising a pair of hydraulic lines communicating with respective said cylinders and opening into each of the cylinders between the piston and metering valve member therein, the piston outer diameter exceeding the outer diameter of the valve member so that fluid introduced into a said cylinder at pressure urges the piston to move in said one direction against the restraining means.

4,919,167

CHECK VALVE

Wayne E. Manska, 1921 Kellogg Dr., Anaheim, Calif. 92807

Filed Mar. 17, 1989, Ser. No. 325,551
Int. Cl.[5] F16K *15/14*
U.S. Cl. 137—512 **26 Claims**



1. A check valve for regulating fluid flow, said check valve having a forward flow direction in which flow through said valve occurs at a predetermined cracking pressure and a reverse flow direction in which flow through said valve is prevented, said check valve comprising:

a housing comprising a channel having an inlet section and an outlet section, said inlet and outlet sections comprising respective luer fittings for connection to medical devices;

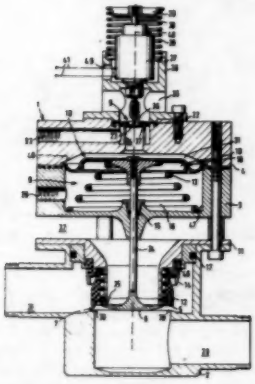
a seat member including a seating portion, said seat member including a passageway;

a valve member, said valve member including a body portion and an elastomeric valve flange portion forming a valve cavity which receives said seating portion to form a sealing interface therebetween over a seal length L, said valve flange portion (i) being sealed to said body portion to prevent fluid flow therebetween, and (ii) being axially positioned with respect to said seating portion to provide a force which urges said valve flange portion against said seating portion to yield a predetermined cracking pressure for said check valve, said force being comprised of an axial component and a radial component, said members being configured such that said radial component is substantially greater than said axial component, said elastomeric valve flange portion expanding in response to positive fluid pressures greater than said cracking pressure at said inlet section to form an area between said valve flange portion and said seating portion for passage of fluid therebetween, said members configured to at least maintain said seal length L in response to substantial reverse pressure to prevent fluid flow in said reverse flow direction, said body portion being retained by a portion of said housing to prevent axial movement of said valve member away from said seat member in said forward flow direction.

4,919,168
VALVE ARRANGEMENT

Wilfried Wagner, Huettenberg/W, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 28, 1988, Ser. No. 264,129
Claims priority, application Fed. Rep. of Germany, Nov. 20, 1987, 3739337
Int. Cl.[5] F15B *13/043*
U.S. Cl. 137—627.5 9 Claims



1. A valve arrangement comprising a housing, electromagnetically actuatable preliminary control valve means for controlling a differential pressure in said housing, a main valve in said housing, said main valve actuatable by the differential pressure, said main valve including a closing element for selectively connecting an outlet connection and at least one inlet connection, wherein said main valve is connected to a movable wall and is exposed to a balanced pressure thereacross in a rest condition, said wall being pressurizable by the differential pressure to change over said main valve, wherein said housing of the valve arrangement is subdivided into a valve housing, a vacuum housing and a control housing, said movable wall being arranged in a cavity which is located between said vacuum housing and said control housing, said movable wall subdividing said cavity into a vacuum chamber and a ventable power chamber, wherein said movable wall is formed by a diaphragm which is inserted in said housing between said vacuum housing and said control housing and by a diaphragm dish which is pre-tensioned by a return spring and which is engaged by a main valve actuating tappet, wherein said tappet is guided within said vacuum housing and is provided with a first valve disk at which a first sealing seat of said main valve is located, wherein said first sealing seat is arranged coaxially with a second sealing seat provided in said valve housing, said first sealing seat contacted by said closing element of said main valve in the rest position, wherein said closing element is formed by an axially symmetrical elastic valve element which is pre-tensioned in a direction toward said first and second sealing seats by means of a valve spring.

4,919,169
GAS FLOW DIVERTER

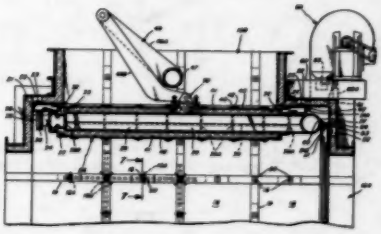
Lothar Bachmann, Box 519, and William F. Koch, R.R. 3, Box 483, both of, Auburn, Me. 04210

Continuation-in-part of Ser. No. 55,594, May 29, 1987, Pat. No. 4,821,507. This application Apr. 14, 1989, Ser. No. 338,917
Int. Cl.[5] F16K *1/00*
U.S. Cl. 137—875 12 Claims

1. In a gas flow diverter for diverting hot gases from an inlet port to either of first and second mutually spaced outlet ports of a chamber by a blade pivotally mounted to swing between two positions within the chamber in each of which one outlet port is closed by the blade and the other is opened, said blade being connected to a pivot shaft rotatably mounted within said chamber and being linked by toggle joints to an actuator shaft spaced from and parallel to said pivot shaft, the improvement comprising

a marginal frame about said blade, both sides of which comprise first ledges, and a central projection, both sides of which comprise second ledges,

a U-shaped sealing frame surrounding each outlet port, and



comprising first and second side walls, with said first side wall longer than said second side wall, each of said sealing frames secured to the chamber wall and having an open end that opens into the chamber; and

leaf spring sealing members mounted on said side walls;

the sealing members of said first and second side walls being constructed and arranged to enter into sealing engagement with said first and second ledges, respectively, on the appropriate side of said blade marginal frame when said blade is in one of said two positions and said actuator shaft being operable to adjust the position of said blade between said first and second positions.

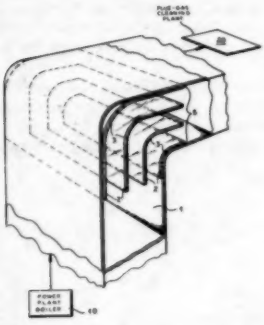
4,919,170
FLOW DUCT FOR THE FLUE GAS OF A FLUE GAS-CLEANING PLANT

Dietmar Kallinich, Gelsenkirchen; Wolfgang Hahlert, and Peter Thom, both of Castrop-Rauxel, all of Fed. Rep. of Germany, assignors to Veba Kraftwerke Ruhr Aktiengesellschaft, Gelsenkirchen-Buer and Flachglas Aktiengesellschaft, Furth, both of, Fed. Rep. of Germany

Filed Aug. 5, 1988, Ser. No. 230,277
Claims priority, application Fed. Rep. of Germany, Aug. 8, 1987, 3726492
Int. Cl.[5] F15D *1/04*
U.S. Cl. 138—39 6 Claims

1. A flow duct for flue gas of a flue gas cleaning plant, comprising:

a plurality of duct walls defining an elbow connected in said plant to be traversed by a flue gas; and



a plurality of arcuately bent self-supporting plate glass flow guide elements disposed in said elbow and defining spaces between them traversed by said flue gas.

4,919,171

AIR JET WEAVING LOOM WITH AN EXPANDER HAVING AN EXTENSION

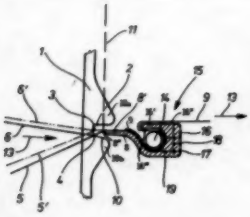
Peter Dornier, Lindau, Fed. Rep. of Germany, assignor to Lindauer Dornier Gesellschaft mbH, Lindau, Fed. Rep. of Germany

Filed Apr. 7, 1989, Ser. No. 335,043

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1988, 3811653

Int. Cl.[5] D03D *47/30*; D03J *1/22*

U.S. Cl. 139—435.1 **4 Claims**



1. An air jet weaving loom, comprising a weaving reed including reed teeth forming a weft thread insertion channel for beating-up each inserted weft thread at a beat-up point, a rod-type expander arranged alongside said weaving reed to face said weft thread insertion channel, said rod-type expander having a top section (16) forming fabric supporting surfaces (16″) and (16‴), and a bottom section (17) enclosing with said top section an expander channel (19) through which finished fabric is passed in a spread manner, a fabric guide rod (14) extending longitudinally in said expander channel (19) for guiding said fabric through said expander channel before said fabric can loop around said top section (16), said expander bottom section (17) having an extension (8) with a straight edge (8″) and a flat top surface (8′) forming an elongation of said fabric supporting surface (16‴) of said top section, said straight edge (8″) being positioned in the proximity of said beat-up point for projecting into said weft thread insertion channel during beat-up so as to positively located said beat-up point.

4,919,172

METHOD AND APPARATUS FOR PLYING A WEFT THREAD DIRECTLY IN AN AIR NOZZLE LOOM

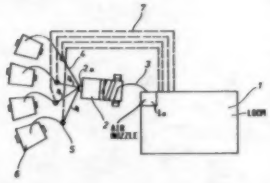
Rudolf Riezler, Nonenhorn, and Adnan Wahhoud, Lindau-Bodolz, both of Fed. Rep. of Germany, assignors to Lindauer Dornier Gesellschaft mbH, Lindau, Fed. Rep. of Germany

Filed Apr. 7, 1989, Ser. No. 335,119

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1988, 3813060

Int. Cl.[5] D03D *47/30, 47/34*

U.S. Cl. 139—435.1 **3 Claims**



1. An air nozzle loom, comprising weft thread insertion air nozzle means, strand plying and weft thread storing means for plying a plurality of weft thread strands into at least one multi-ply weft thread directly in said air nozzle loom and for storing a length of multi-ply weft thread, a plurality of weft thread strand supply spools for supplying the individual weft thread strands to said plying and storing means, the yarn receiving opening of said weft thread insertion air nozzle means being positioned adjacent to and facing said plying and storing means on a weft thread insertion side of said air nozzle loom for directly receiving multi-ply weft thread from said plying and storing means and to insert a multi-ply weft thread into a loom shed, said strand plying and storing means being operatively located between said strand supply spools and said air nozzle means, said length of multi-ply weft thread being sufficient to provide a smooth supply of weft thread to said air nozzle means throughout an insertion period.

4,919,173

YARN STORAGE AND FEEDING DEVICE WITH RESILIENT BLOCKING BELT

Lars H. G. Tholander, Fagelstigen 7, 56100 Huskvarna, Sweden

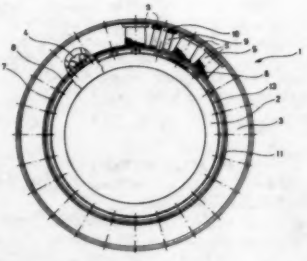
PCT No. PCT/EP87/00467, § 371 Date May 6, 1988, § 102(e) Date May 6, 1988, PCT Pub. No. WO88/01315, PCT Pub. Date Feb. 25, 1988

PCT Filed Aug. 19, 1987, Ser. No. 192,510

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1986, 3628485

Int. Cl.[5] D03D *47/36*

U.S. Cl. 139—452 **8 Claims**



1. A yarn storage device for a weaving loom comprising, a stationary yarn storage drum onto which a yarn supply can be

wound and withdrawn from a yarn withdrawal end of said drum, a ring surrounding said yarn withdrawal end in spaced-apart relation thereto to form a gap between said ring and said drum, a belt of resilient material circumferentially mounted on said drum, a plurality of spaced-apart yarn blocking elements connected to and extending from said belt, actuating means upon selective actuation for moving radially from a yarn withdrawal position one of said blocking elements and a connected portion of said belt elastically to cause said one blocking element to extend toward said ring and into said gap to prevent yarn from being withdrawn from said drum, and said one blocking element and said elastically moved connected portion of said belt elastically returning to said yarn withdrawal position upon deactuation of said actuating means.

4,919,174

FILLING MEANS

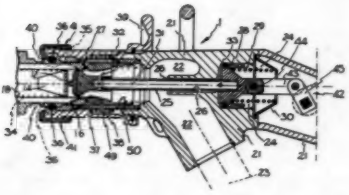
John R. Warland, 5 William St., Hamilton, N.S.W., 2303, Australia

Filed Apr. 10, 1987, Ser. No. 37,188

Claims priority, application Australia, Apr. 11, 1986, PH05426

Int. Cl.[5] B65B *1/30*

U.S. Cl. 141—384 **1 Claim**



1. In a vehicle servicing system having a liquid receiver (34) adapted to be mounted in the sidewall of a tank and including a hollow cylindrical portion having an outer end and an outer wall, an annular bead (35) on the outer wall, an annular groove (40) on said outer wall adjacent the annular bead (35), valve means (16) for closing the outer end, and a spring biased operculum (12) adapted to normally close the valve means (16), in combination with a nozzle;

the combination being characterized in that the nozzle comprises:

a housing (21) having a separate chamber (24) and a liquid delivery chamber (22) adapted to communicate with a hose (23) for delivery of liquid;

a muzzle portion on said housing (21) including a free end, a peripheral array of ball bearings (36) on said free end, an axially movable spring-biased collet (37) surrounding said free end and shrouding said array of ball bearings (36), said collet (37) being movable away from said free end whereby said array of ball bearings (36) are adapted to ride over said annular bead (35) on said outer wall of the receiver (34) to unlock said muzzle portion from the receiver (34), said collet (37) being movable toward said free end whereby said array of ball bearings (36) are adapted to engage said annular groove (40) on said outer wall of the receiver (34) to lock said muzzle portion to the receiver (34);

a piston assembly movable within said housing (21) including a piston rod (25) having opposite end portions, a piston head (27) on one end portion in said muzzle portion, and a large portion (28) fixed on the other end portion in said separate chamber (24) and having a sealed piston surface adapted to be pressure responsive for moving said large portion (28) in one direction, a compression spring (29) in said separate chamber (24) biasing said large portion (28) in a direction opposite said one direction along with said piston rod (25) and the piston head (27) causing displacement of the operculum (12) to an opened position, a longitudinal passageway (31) extending through said piston rod (25) between the opposite ends thereof, a first port means (32) in the one end portion of said piston rod (25) adjacent the piston head (27) to communicate with said longitudinal passageway (31), a second port means (33) in the other end portion of said piston rod (25) to communicate with said longitudinal passageway (31), said first port means (32) communicating with the delivery chamber (22) and said second port means (33) communicating with a portion of said separate chamber (24) sealed by the large portion (28) whereby back pressure in the muzzle portion when liquid fills the tank acts on the piston surface of large portion (28) causing displacement of the piston head (27) whereby the spring biased operculum (12) moves to a closed position; and,

a cocking handle (42) operatively connected to said large portion (28) on said piston rod (25) and being manually operable to move said piston rod (25) longitudinally in said housing (21) and thereby displace the operculum (12) to an opened piston after said array of ball bearings (36) engage the annular groove (40).

4,919,175

TREE DELIMBING APPARATUS

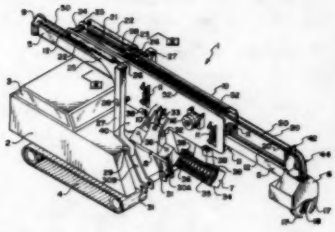
G. Leo Samson, Kamloops, Canada, assignor to Harricana Metal, Inc., Quebec, Canada

Filed Jul. 22, 1988, Ser. No. 223,234

Claims priority, application Canada, Jul. 24, 1987, 543001

Int. Cl.[5] B27L *1/00*; A01G *23/08*

U.S. Cl. 144—2 Z **9 Claims**



1. A delimbing apparatus adapted to be mounted on a supporting vehicle, comprising:

(a) a frame;

(b) a boom mounted for extension and retraction in said frame and having at one end a delimbing head including gripping jaws and delimbing knives; and

(c) driving means for grasping a log and driving said log through said delimbing head, said driving means including a first drive belt mounted on the underside of said frame, and second and third drive belts pivotally mounted below and to either side of said frame.

4,919,176

RAMPED DEVICE FOR FINITE POSITIONING OF PANEL JOINT FORMING TOOL

Benton W. Gachet; Dennis C. Hunstman; Matthew G. Popik, and Robert W. Taylor, all of Jackson, Tenn., assignors to Porter Cable Corporation, Jackson, Tenn.

Filed Apr. 17, 1989, Ser. No. 339,001

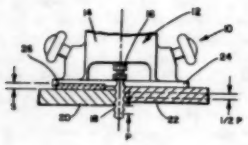
Int. Cl.[5] B23C *1/20*

U.S. Cl. 144—134 D **10 Claims**

1. An assembly for cutting matching panel joints which is adapted to be connected to a cutting tool that has a waveform cutting bit which repeats periodically in profile along its length, comprising:

a base body having a top surface which is adapted to be secured to the cutting tool, and a lower ramped slide surface extending at a first angle with respect to said top surface;

a slide member having a top ramped bearing surface which contacts said lower ramped slide surface for sliding movement therebetween, and a lower bearing surface adapted



for contacting a work piece, said top ramped bearing surface extending at a second angle with respect to said lower bearing surface that is equal to said first angle; and

means for releasably securing said slide member at a selected position with respect to said base body, whereby the position of said lower bearing surface may be adjusted with respect to the cutting bit.

4,919,177

METHOD OF TREATING TI-NI SHAPE MEMORY ALLOY

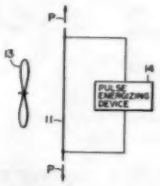
Dai Homma, Room C-103, Mezon-yokohamanohkendai, 12-72, Horiguchi, Kanazawa-ku, Yokohama-shi, Kanagawa-ken, Japan

Filed Mar. 29, 1988, Ser. No. 174,949

Claims priority, application Japan, Mar. 30, 1987, 62-73982

Int. Cl.[5] C22F *1/00, 1/10*

U.S. Cl. 148—133 **5 Claims**



1. A method of arranging the crystal orientation of a Ti-Ni shape memory alloy comprising the steps of:

(a) heating a wire of the Ti-Ni shape memory alloy to a high temperature with a predetermined range to turn said alloy into a solid solution, and thereafter, cooling said wire, whereby plastic strain in said wire is removed and crystals of said alloy are grown;

(b) passing current pulse through said wire to rapidly heat said wire to a temperature higher than its $M_f$point to cause elongation due to transformation induced superplasticity to said wire;

(c) stopping the application of the pulse, rapidly cooling said wire to the temperature of its $M_f$point or below, applying tensile load immediately after the stop of the application of the pulse to cause elongation again in a cooling process of said wire, and removing or sufficiently decreasing said tensile load to stop the deformation when the value of m with regard to said wire is sharply decreased; and

(d) repeating said steps (b) and (c) a required number of times.

4,919,178

EXPLOSIVE EMULSION

Alan T. Riga, Cleveland, and John W. Forsberg, Mentor, both of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Continuation-in-part of Ser. No. 367,185, Jun. 16, 1989, which is a continuation of Ser. No. 931,377, Nov. 14, 1986, Pat. No. 4,840,687, and a continuation-in-part of Ser. No. 137,303, Dec. 23, 1987, Pat. No. 4,863,534, and a continuation-in-part of Ser. No. 265,877, Nov. 1, 1988, which is a division of Ser. No. 137,301, Dec. 23, 1987, Pat. No. 4,828,633. This application Jul. 14, 1989, Ser. No. 380,054

Int. Cl.[5] C06G *45/00*

U.S. Cl. 149—2 **5 Claims**

1. An explosive emulsion comprising a discontinuous oxidizer phase comprising at least one oxygen-supplying component, a continuous organic phase comprising at least one carbonaceous fuel, and an emulsifying amount of a composition comprising the reaction product of component (I) with component (II);

component (I) comprising:

(A) the reaction product of

(A)(i) at least one carboxylic acid or anhydride, or ester or amide derived from said acid or anhydride, with

(A)(ii) ammonia, at least one amine, at least one alkali metal and/or at least one alkaline-earth metal; or

(B) a composition comprising

(B)(i) the reaction product of (B)(i)(a) at least one high-molecular weight hydrocarbyl-substituted carboxylic acid or anhydride, or ester or amide derived form said high-molecular weight acid or anhydride, with (B)(i)(b) ammonia, at least one amine, at least one alkali metal and/or at least one alkaline-earth metal, component (B)(i)(a) having at least one hydrocarbyl substituent having an average of about 20 to about 500 carbon atoms; and

(B)(ii) the reaction product of (B)(ii)(a) at least one low-molecular weight carboxylic acid or anhydride, or ester or amide derived from said low-molecular weight acid or anhydride, with (B)(ii)(b) ammonia, at least one amine, at least one alkali metal and/or at least one alkaline-earth metal, component (B)(ii)(a) optionally having at least one hydrocarbyl substituent having an average of up to about 18 carbon atoms; or

(C) a composition comprising

(C)(i) the reaction product of (C)(i)(a) at least one high-molecular weight hydrocarbyl-substituted polycarboxylic acid or anhydride, or ester or amide derived from said high-molecular weight polycarboxylic acid or anhydride, with (C)(i)(b) ammonia, at least one amine, at least one alkali metal and/or at least one alkaline-earth metal, component (C)(i)(a) having at least one hydrocarbyl substituent having an average of about 20 to about 500 carbon atoms; and

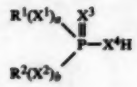
(C)(ii) the reaction product of (C)(ii) (a) at least one low-molecular weight polycarboxylic acid or anhydride, or ester or amide derived from said low-molecular weight polycarboxylic acid or anhydride, with (C)(ii)(b) ammonia, at least one amine, at least one alkali metal and/or at least one alkaline-earth metal, component (C)(ii)(a) optionally having at least one hydrocarbyl substituent having an average of up to about 18 carbon atoms;

said components (C)(i) and (C)(ii) being couples together by (C)(iii) at least one compound having (C)(iii)(a) two or more primary amino groups, (C)(iii)(b) two or more secondary amino groups, (C)(iii)(c) at least one primary amino group and at least one secondary amino group, (C)(iii)(d) at least two hydroxyl groups, or (C)(iii)(e) at least one primary or secondary amino group and at least one hydroxyl group; or

(D) mixture of two or more of (A), (B) and (C);

component (II) comprising:

(A') at least one phosphorous-containing acid represented by the formula



wherein X^1, X^2, X^3 and X^4 are independently oxygen or sulfur; a and b are independently zero or one, and R^1 and R^2 are independently hydrocarbyl groups; or

(B') at least one salt derived from said phosphorous-containing acid (A') and at least one metal selected from the group consisting of magnesium, calcium, strontium, chromium, manganese, iron, molybdenum, cobalt, nickel, copper, silver, zinc, cadmium, aluminum, tin, lead, and mixtures of two or more thereof; or

(C') mixture of (A') and (B'); with the proviso that when component (II) is (A'), component (I) is (B), (C) or a mixture of (B) and (C).

4,919,179

WATER-IN-OIL EMULSION EXPLOSIVE

Arun K. Chattopadhyay, McMasterville, Canada, assignor to Imperial Chemical Industries PLC, London, England

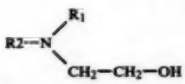
Filed Aug. 11, 1989, Ser. No. 392,367

Claims priority, application United Kingdom, Sep. 21, 1988, 8822187

Int. Cl.[5] C06G *45/00*

U.S. Cl. 149—2 **7 Claims**

1. A water-in-oil explosive emulsion comprising a continuous oil phase, a discontinuous aqueous phase, and a minor amount of emulsifier, wherein the emulsifier comprises a surfactant which is the reaction product formed by the esterification of polyalk(en)yl succinic anhydride by an adduct of the formula:



where

R_1 is H or $-CH_2-CH_2-OH$

and

R_2 is selected from the group consisting of an alk(en)yl or acyl group containing 8–20 carbon atoms in the backbone of the hydrocarbyl chain and a hydroxy ethyl ester of a mono- or di-carboxylic acid containing from 8–20 carbon atoms in the hydrocarbyl chain (aside from any pendant methyl groups) and not more than 6 atoms in the remaining link to the N atom.

4,919,180

FIXED OR SLEEVE-MOUNTED SPIKE, FITTED ON A VEHICLE TIRE

Unto Lindén, Hämeenlinna, Finland, assignor to Neste Oy, Finland

PCT No. PCT/FI87/00154, § 371 Date Aug. 24, 1988, § 102(e) Date Aug. 24, 1988, PCT Pub. No. WO88/03876, PCT Pub. Date Jun. 2, 1988

PCT Filed Nov. 17, 1987, Ser. No. 223,236

Claims priority, application Finland, Nov. 26, 1986, 864820

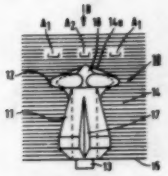
Int. Cl.[5] B60C *11/14*

U.S. Cl. 152—210 **8 Claims**

1. A fixed spike fitted in a vehicle tire and being shaped such that when the spike is in a state at rest, a region thereof in contact with rubber of the tire is substantially smaller than total outer surface area of the spike, wherein

the spike comprises a flange having at least one eminence forming said contact region,

whereby flow of the rubber around the fixed spike caused by viscoelastic properties of the rubber softens first contact between a tip of the fixed spike with a road surface,



wherein said flange additionally comprises at least one depression,

whereby flow of the rubber into said at least one depression produces a force rotating the spike.

4,919,181

FIXED SPIKE OR SLEEVE-MOUNTED SPIKE FITTED ON A VEHICLE TIRE

Unto Linden, Hämeenlinna, and Erkki Suvanto, Porvoo, both of Finland, assignors to Neste Oy, Finland

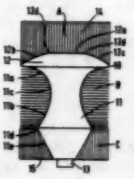
PCT No. PCT/FI87/00155, § 371 Date Aug. 17, 1988, § 102(e) Date Aug. 17, 1988, PCT Pub. No. WO88/03877, PCT Pub. Date Jun. 2, 1988

PCT Filed Nov. 17, 1987, Ser. No. 223,237

Claims priority, application Finland, Nov. 26, 1986, 864821

Int. Cl.[5] B60C *11/14*

U.S. Cl. 152—210 **4 Claims**



1. A fixed spike fitted in a vehicle tire and comprising a body and a flange mounted on said body, a part of said body facing said flange having an inward curvature such that said flange and at least said part of said body facing said flange have no detrimental sharp discontinuities, and

rubber of the tire is arranged to flow smoothly around said spike at least in a first region between said flange and said body of the tire and in a second region of said body part facing said flange,

said flange comprising depressions arrange such that flow of the tire rubber thereinto produces a force rotating said spike,

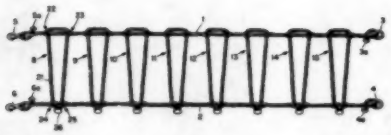
whereby formation of air pockets and simultaneously damage to said tire rubber can be substantially avoided, and additionally, at the same time, a force can be produced which better supports said spike in said second region.

4,919,182

MOTOR VEHICLE EMERGENCY TIRE TRACTION IMPROVEMENT DEVICE CONSISTING OF POLYMERIC ROPE

Stephen Proulx, 601 Newtown Rd., Littleton, Mass. 01460, and Paul Rowe, 41 Watertown St., Lexington, Mass. 02173

Filed Jul. 28, 1988, Ser. No. 225,309
Int. Cl.[5] B60C *27/16*; E06C *5/26*
U.S. Cl. 152—221 **15 Claims**



1. A traction improvement device for attachment to a motor vehicle tire to improve said tire traction when the motor vehicle is driven on ice and snow or in mud, comprising:

(a) at least two longitudinally oriented lengths of multi-strand twisted rope in which the strands are made of polymeric plastic, each length of rope forming a runner and being less than the perimeter length of said tire;

(b) one or more other transversely oriented lengths of multi-strand twisted rope in which the strands are made of polymeric plastic, the transversely oriented lengths being essentially transverse to the runners and extending between said runners, each transversely oriented length having one end threaded through the strands of at least one of the runners and an opposite end threaded through the strands of at least an other runner to form slippable connections with the runners, the connections thereof to said runners being spaced along each of said runners and defining a plurality of transverse members, said transverse members being formed in pairs, each pair being formed by a single, transversely oriented length of rope threaded through one or more places of each of said runners, said runners and said transverse members defining a ladder-like arrangement of which said runners are separated by a dimension greater than the width of said tire; and

means at the ends of each of said runners for connecting said runner ends together,

such that said tire traction device is attachable to said tire with said runners on opposite sides of said tire, each runner following generally the periphery of said tire and said transverse members are arranged around the periphery of said tire each being oriented substantially perpendicular to said runners and to the direction of rotation of said tire rotation.

4,919,183

SELF SEALING PNEUMATIC TIRE

Robert L. Dobson, Tallmadge, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 536,480, Sep. 28, 1983, abandoned. This application Jun. 21, 1985, Ser. No. 747,538
Int. Cl.[5] B60C *21/08*
U.S. Cl. 152—502 **12 Claims**

1. A pneumatic rubber tire having a composite of open network structure containing a sealant composition adhered to the inner liner of said tire, where said composite is enveloped by the inner liner of said tire and an outer overlaying rubber coverstrip and is comprised of (A) a three-dimensional, open network of spaced apart filamentary elements in the form of a skeletal structure comprised of (i) resilient, flexible, open cell foam, or (ii) three dimensional mat of flexible organic polymer filaments which are woven or non-woven and are bonded at least 80% of their crossings and (B) a sealant composition contained in said skeletal structure, where said coverstrip covers the outer surface of said composite, is folded around its edges to cover its two edges and a portion of the opposing surface of the composite and is integral, covulcanized and terminate with said tire inner liner; wherein said open cell foam is composed of a flexible, resilient material selected from at least one of natural rubber, synthetic rubber and polyurethane; where the filaments of said mat are composed of a flexible organic thermoset polymer or a thermoplastic polymer having a softening point of at least 200° C.; and where said sealant composite is a tacky composition comprised of (i) about 100 parts by weight of a rubber selected from uncured cis 1,4-

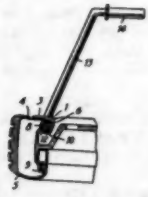
polyisoprene rubber or partially cross-linked butyl rubber, (ii) about 40 to about 300 phr of fluid polymeric material selected from at least one of rubber processing oil and polybutene having a viscosity in the range of about 25 to about 5000 centistokes at 100° C., (iii) when (i) is butyl rubber, about 40 to about 300 phr of polyisobutylene having a viscosity average weight in the range of about 8000 to about 135,000 (Staudinger), (iv) about 40 to about 140 phr of at least one of the group consisting of particulate carbon black and clay and (v) about 40 to about 120 phr of a tackifying resin.

4,919,184

LEVER FOR REMOVING MOTORCAR TIRES

Francis du Quesne, Kleistraat 138, 2630 Aartselaar, Belgium

Filed Mar. 13, 1989, Ser. No. 322,311
Claims priority, application Belgium, Mar. 14, 1988, 8800290
Int. Cl.[5] B60C *25/04*
U.S. Cl. 157—1.3 **7 Claims**



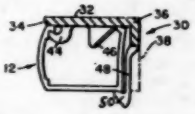
1. A lever for the removal of a tire from a wheel rim of a motorcar wheel having a tire cheek and a tire bead, said lever comprising: a support with an inverted angle-iron shape having a horizontal part cooperating with the tire cheek and a vertical part cooperating with the tire bead and the wheel rim, said vertical part being extended by a hooking element insertable between the tire bead and the wheel rim for removing the tire, an arm fixed at an angle in a vertical plane on the horizontal part of said support, and a grip fixed to the end of said arm.

4,919,185

HEADRAIL AND BRACKET COMBINATION FOR SUPPORTING BLINDS

Paul E. Comeau; John M. DeBeau, and Anthony Torti, all of Warwick, R.I., assignors to Kenney Manufacturing Company, Warwick, R.I.

Filed Mar. 21, 1988, Ser. No. 170,936
Int. Cl.[5] E06B *9/38*
U.S. Cl. 160—178.1 **21 Claims**



1. A headrail and mounting bracket combination for attachment to a window opening and for supporting a covering for said window, comprising:

an elongated, hollow, U-shaped main body portion having a horizontal bottom wall having longitudinally extending front and rear edges;

a front wall and a rear wall for said main body portion, said front and rear walls standing up respectively from the front and rear edges of said bottom wall, and each having longitudinally extending upper and lower edges;

a one piece bracket for supporting at least a part of said main body portion, comprising a top plate having a front and a rear edge, a rear plate extending downwardly from the rear edge of said top plate, and means associated with each of said plates for attachment to said window opening;

means associated with the top plate of said bracket for restricting said rear wall of said main body portion from forward motion when pivoted upwardly into said bracket; and

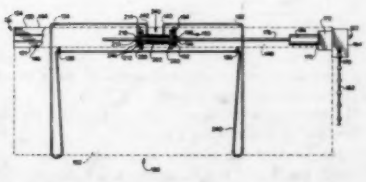
spring means associated with the rear plate of said bracket for clampingly engaging the lower edge of the rear wall of said main body portion in a locked position when the train body portion is so restricted against forward motion.

4,919,186

BLIND OPERATING DEVICE AND METHOD

William F. Uecker, 811 W. River Terr., McHenry, Ill. 60050; Earl M. Jahnke, 24 S. Pistakee Lake Rd., Fox Lake, Ill. 60020, and Kenneth Hughes, 24946 - B Lake Shore Dr., Round Lake, Ill. 60078

Filed May 24, 1989, Ser. No. 366,876
Int. Cl.[5] E06B *9/20*
U.S. Cl. 160—321 **17 Claims**



1. A blind assembly including a blind frame and a window covering operably mounted in said blind frame wherein:

a. said blind frame has a top portion and a bottom portion;

b. a control assembly for operating said window covering is mounted at a control end of said blind frame;

c. an idle end of said blind frame is oppositely disposed from said control end of said blind frame;

d. said top portion and said bottom portion are between said idle end and said control end;

e. a reelable roll cord supports said window covering;

f. a reel assembly is mounted in said blind frame between said idle end and said contol end to receive said reelable roll cord and move said window covering;

g. said roll cord has a first roll cord end and a second roll cord end;

h. said roll cord is secured to said reel assembly at said first roll cord end and at said second roll cord end;

j. a first loop roller aperture and a second loop roller are secured to a bottom portion of said blind frame;

k. a first roll cord holder aperture and a second roll cord holder aperture are in a top portion of said blind frame;

l. a first roller aperture and a second roller aperture are situated between said first loop roller aperture and said second loop roller aperture in said top portion adjacent said reel assembly;

l. said second loop roller aperture is closer to said idle end than said control end;

m. said first loop roller aperture is closer to said control end than said idle end; and

n. said roll cord passes from said reel assembly at said first roll cord end, upwardly through said top portion at said first roller aperture toward said control end along a top of said frame, downwardly through said top portion at said first roll cord holder aperture to said window covering, upwardly from said window covering through said first loop roller aperture on said lower portion, toward said idle end through said second loop roller aperture on said lower portion, downwardly toward said window covering, upwardly through said top portion at said second roller holder aperture, along said top portion toward said control end, and downwardly through said top portion at said second roller aperture so that said second roll cord end is secured to said reel assembly.

4,919,187

METHOD FOR MAKING ADDITIONS TO MOLTEN ALLOYS AND BODIES MOLDED FROM ALLOYING METALS

Hartwig Rupp, Frankfurt am Main, and Otto Stenzel, Grundau, both of Fed. Rep. of Germany, assignors to Leybold Heraeus GmbH, Cologne, Fed. Rep. of Germany

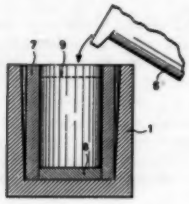
Continuation of Ser. No. 908,332, Sep. 17, 1986, abandoned. This application Aug. 9, 1988, Ser. No. 230,707
Int. Cl.[5] C22C *21/00*; B22D *19/16*
U.S. Cl. 164—57.1 **10 Claims**

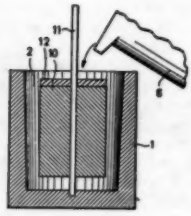
1. A method for the charging and controlled addition of a pre-alloy casting to a batch of molten alloys comprising:

forming a batch of molten alloys of metals in a heated crucible which is contained in a nonreactive atmosphere, the metals comprising lithium and a metal that is nonreactive at room temperature;

preparing a pre-alloy composite casting having a core portion and surface layer portion, the core portion having sufficient lithium to be reactive at room temperature, and the surface layer portion being nonreactive at room temperature, the preparing step comprising the steps of forming one portion of said composite, solidifying the one portion of the composite and then adding and solidifying the other portion so as to form a pre-alloy casting having

an average content of lithium that is greater than the lithium content of the molten alloys in the crucible; and





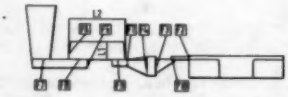
adding the pre-alloy casting to the batch of molten alloys in the crucible to add the prescribed amount of lithium to form an end product.

4,919,188

MOULD AND PROCESS FOR THE PRODUCTION OF NODULAR OR COMPACTED GRAPHITE IRON CASTINGS

Manfred Fessel, Rhede, and Gerd Trinkl, Borken, both of Fed. Rep. of Germany, assignors to Foseco International Limited, Birmingham, United Kingdom

Filed May 17, 1989, Ser. No. 353,475
Int. Cl.[5] B22C *9/00*
U.S. Cl. 164—58.1 **20 Claims**



1. A mould for the production of a nodular or compacted graphite iron casting the mould having parts comprising a treatment sprue, a runner, a slag trap, a filter chamber having an ingate and an outlet and having located therein a ceramic filter having an inlet and outlet, a casting cavity ingate and a casting cavity, the parts of the mould having a relationship one with another such that

F2=0.8 F1 to 1.2 F1
F3=30% F4 - 100% F4
F4≧4.5 F1
F5≧1.3 F1
F6=2 F5 - 4 F5
F7≧F5 and ≦F6
F8≧F5 and ≦F6
F9=1.2 F1 - 3 F1
F10≧F2
L2:L1=3:1 to 8:1
L1:L3=1:1 to 3:1

where

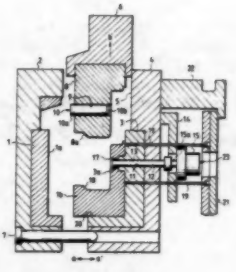
F1 is the cross-sectional area of the filter chamber ingate
F2 is the cross-sectional area of the casting ingate
F3 is the area of the filter outlet
F4 is the area of the filter inlet
F5 is the vertical cross-sectional area of the runner
F6 is the vertical cross-sectional area of the slag trap
F7 is the area of the interface of the reaction sprue and the runner
F8 is the area of the interface of the runner and the slag trap
F9 is the area of the interface of the slag trap and the filter ingate
F10 is the area of the interface of the filter chamber outlet and the casting ingate
L1 is the height of the slag trap
L2 is the length of the slag trap and
L3 is the width of the slag trap

4,919,189

METHOD OF FORMING AS-CAST HOLES BY USING CORES, AND APPARATUS FOR PRACTICING THE METHOD

Keiji Sato, and Yasutaka Nakatsukasa, both of Hiroshima, Japan, assignors to Ryobi Ltd., Hiroshima, Japan

Filed Sep. 21, 1988, Ser. No. 247,146
Claims priority, application Japan, Sep. 21, 1987, 62-237882; Dec. 16, 1987, 62-319260
Int. Cl.[5] B22D *33/04*
U.S. Cl. 164—137 **13 Claims**



1. An apparatus for forming a casting (*1b*) with an as-cast hole (17), the apparatus comprising:

a mold comprising a stationary die (1), a movable die (3), and a core die (8) for forming a cavity;

means for opening and closing said mold by moving said movable die in first and second opposite directions (a',a), respectively; and

means for moving said core die in third and fourth opposite directions (b',b),

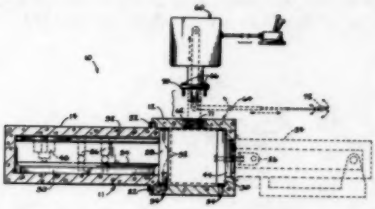
wherein said core die has front and side surfaces for forming said cavity and has a hole (9) formed therein, and said mold further comprises a floating core (10) disposed in said hole for movement with respect to said core die in fifth and sixth opposite directions which are transverse to said third and fourth directions.

4,919,190

RADIOACTIVE WASTE MATERIAL MELTER APPARATUS

Darrell F. Newman, and Wayne A. Ross, both of Richland, Wash., assignors to Battelle Memorial Institute, Richland, Wash.

Filed Aug. 18, 1988, Ser. No. 234,253
Int. Cl.[5] B22D *27/02*
U.S. Cl. 164—250.1 **8 Claims**



1. A radioactive waste material melting apparatus for melting metallic radioactive waste material for consolidating such material into a radioactive ingot for storage, the apparatus comprising:

a radiation shielded enclosure, the enclosure comprising at least two separate sections which are removably interconnected, transportable, and reusable, one such section comprising a process chamber, another such section comprising a mating cell;

the process chamber being sized, shaped and dimensioned to facilitate transportability of the chamber and apparatus, the process chamber including a mating cell opening;

a reusable mold received within the process chamber, and being repeatably transportable therewith, for receiving and cooling melted radioactive material to form an ingot;

a plasma torch mounted within the process chamber, and being repeatably transportable therewith, for melting the radioactive waste material into the reusable mold;

the mating cell being sized, shaped and dimensioned to facilitate transportability of the cell and apparatus, the mating cell including a process chamber opening and a transfer cask opening;

the process chamber opening of the mating cell being sized and shaped to join with the mating cell opening of the process chamber, the process chamber being removably attached to the mating cell to place the same in communication with one another through their respective mating cell opening and process chamber opening;

the transfer cask opening being sized and shaped to join with a transfer cask within which radioactive waste material is transferred to the melting apparatus; and

means for sealing the mating cell opening of the process chamber when the process chamber is removed from the mating cell for transport.

4,919,191

MOLTEN-METAL FORMING METHOD AND APPARATUS WHICH ARE BOTTOM-LOADING, BOTTOM-POURING AND BOTTOM-UNLOADING

Craig Brodersen, Reno, Nev., assignor to Jeneric/Pentron Incorporated, Wallingsford, Conn.

Filed May 17, 1988, Ser. No. 195,765
Int. Cl.[5] B22D *25/00*
U.S. Cl. 164—495 **38 Claims**

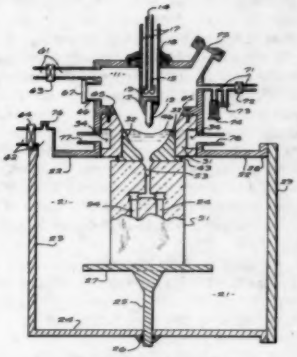
1. The combination of a furnace, a solid charge of metal, and a form for receiving molten metal; said combination comprising:

a structure defining a melting chamber that has an aperture;

a structure defining a forming chamber that is at least partially below the melting chamber and communicates with the melting chamber through the aperture;

means for receiving a solid charge of metal from below to block the aperture;

a solid charge of metal, received at the receiving means;



means, associated with the melting chamber, for heating the charge to melt part of the metal; and

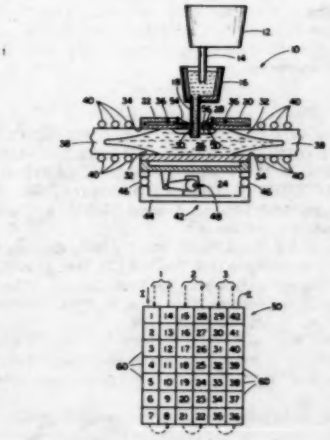
a form, disposed in the forming chamber below the charge, to receive molten metal from the bottom of the charge.

4,919,192

DISCRETE EXCITATION COIL PRODUCING SEAL AT CONTINUOUS CASTING MACHINE POURING TUBE OUTLET NOZZLE/MOLD INLET INTERFACE

Deznis Pavlik, Murrysville Boro, and Richard D. Nathenson, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 201,351, May 27, 1988, abandoned, which is a continuation of Ser. No. 50,272, May 15, 1987, abandoned. This application Mar. 10, 1989, Ser. No. 323,226
Int. Cl.[5] B22D *11/04, 27/02*
U.S. Cl. 164—502 **8 Claims**



1. In a continuous casting machine including a generally

horizontal continuous casting mold having an upper inlet, an internal cavity communicating with and disposed below said inlet for receiving molten metal through said inlet into said cavity, and at least one outlet communicating with said cavity for withdrawing a strand of solidifying metal through said outlet from said cavity, and a pouring tube having a outlet nozzle portion, said pouring tube extending from above said mold downwardly through said mold inlet into said mold cavity so as to be disposed its lower outlet nozzle portion in spaced relation below said mold inlet within said mold cavity, a discrete excitation coil supported coxially about said pouring tube within said mold cavity in the space therein between said upper mold inlet and said lower pouring tube outlet nozzle portion, said coil for generating an electromagnetic levitating and stabilizing force which acts upon the meniscus of the molten metal in said mold cavity at the region of said mold inlet for counteracting the head pressure of molten metal contained within said pouring tube and thereby providing a seal in the area of an interface between said mold inlet and said pouring tube above its outlet nozzle portion, said excitation coil comprising:

(a) means defining multiple electrical conductor turns disposed in series and being capable of carrying an electrical current of adequate density to generate said electromagnetic levitating and stabilizing force; and

(b) means defining plural hydraulic fluid flow path, the number of said multiple electrical conductor turns being at least six times greater that the number of said plural hydraulic fluid flow paths, said hydraulic fluid flow paths being disposed in parallel to, but independent of, one another and in close proximity to said multiple electrical conductor turns, whereby coolant fluid circulation in each of said independent flow paths can provide sufficient cooling of said multiple turns to facilitate conduction therethrough of a high enough density electrical current to produce said required electromagnetic levitating and stabilizing force for providing said seal in the area of said interface;

(c) said means defining said multiple turns being an outer electrical conductor;

(d) said means defining said plural fluid flow paths being plural inner fluid channels being surrounded by, and in contact with, said outer conductor;

(e) said respective inner channels being separated by hydraulic outlet and inlet connections so as to provide discontinuous coolant flow paths;

(f) said outer conductor at said respective outlet and inlet connections of said inner channels having a conducting joint which ensures that the electrical path in said outer conductor is continuous even through said coolant flow paths are discontinuous.

4,919,193

MOLD CORE FOR INVESTMENT CASTING, PROCESS FOR PREPARING THE SAME AND PROCESS FOR PREPARING MOLD FOR INVESTMENT CASTING HAVING THEREWITHIN SAID MOLD CORE

Nobuyoshi Sasaki, 18-3, 1-chome, Aobadai, Midori-ku, Yokohama-shi, Kanagawa-ken, Japan

Continuation of Ser. No. 225,625, Jul. 27, 1988, abandoned, which is a continuation of Ser. No. 936,123, Dec. 1, 1986, abandoned. This application Mar. 31, 1989, Ser. No. 332,445

Claims priority, application Japan, Aug. 14, 1986, 61-189593

Int. Cl.[5] B22C *9/04*

U.S. Cl. 164—516 **1 Claim**

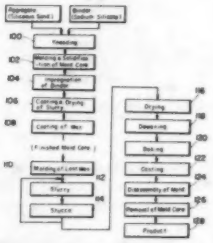
1. A process for preparing an investment casting mold in which molten metal is thereafter cast; said process comprising the steps of:

(a) kneading an aggregate with a first inorganic binder for increasing the strength and integrity of said aggregate for withstanding an injection molding operation for molding a lost model;

(b) molding the kneaded aggregate and first inorganic binder into a core molding mold to be solidified therein to produce a core matrix;

(c) dipping the solidified core matrix in a second inorganic binder bath so that the core matrix is impregnated with the second inorganic binder penetrating from the surface into a marginal portion of the body thereof, said second inorganic binder layer increasing the strength of said core matrix at a high temperature environment which is reached during a mold baking step and thereafter during a molten metal casting step;

(d) coating the core matrix impregnated by said step (c) with a slurry followed by drying to form a coating layer;



(e) covering said coating layer with paraffin wax to produce a core mold;

(f) placing said core mold in position within a shell mold and then pouring a lost model forming material into said shell mold to produce a lost model having therewithin said core mold;

(g) alternately coating a slurry and layer of stucco particles for a plurality of times to form a refractory layer which is then dried;

(h) allowing said lost model to vanish so as to obtain a final mold; and

(i) baking said core mold and said refractory layer simultaneously.

4,919,194

METHOD OF PUTTING A TOOL-CARRYING ROBOT INTO POSITION IN A CONTAINMENT VESSEL

Daniel E. Gery, Cormeilles En Parisis, and Philippe Meunier, L'Etang La Ville, both of France, assignors to Societe Anonyme Dite Hispano Suiza, Saint Cloud, France

Filed Jan. 13, 1989, Ser. No. 296,695

Claims priority, application France, Jan. 14, 1988, 88 00344

Int. Cl.[5] B25J *3/00, 15/04*

U.S. Cl. 165—1 **8 Claims**

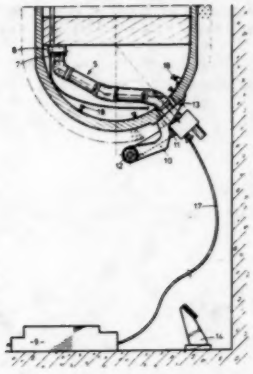
1. A method of placing in position a tool-carrying robot for carrying out operations in a containment vessel defining an operating zone in an environment which is hostile to humans, said containment vessel including an access opening to said operating zone, and said robot being of the kind comprising an articulated arm, a foot-plate provided at one end of said arm for attachment at a first point with known coordinates outside said operating zone, a head provided at the other end of said arm for receiving the tools required for said operations to be carried out, and a central logic unit for controlling said articulated arm, said method comprising the steps of:

attaching the head of said robot at a second point having known coordinates outside said operating zone;

causing said robot to move independently so as to bring said foot-plate into a working position in the vicinity of said access opening while said head remains attached at said

second point and said robot remains outside said access opening;

attaching said foot-plate at said first point;



releasing said head from said second point; and

causing said robot to fold back on itself so as to bring said head to a working position within said operating zone.

4,919,195

CONTROL SYSTEM FOR AIR CONDITIONER

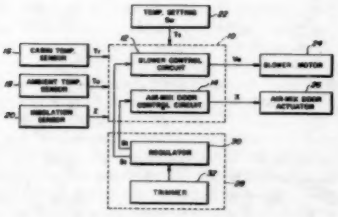
Mikio Tanino, Hadano, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

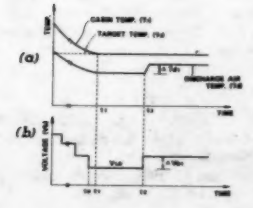
Filed Jan. 15, 1988, Ser. No. 144,206

Claims priority, application Japan, Jan. 16, 1987, 62-6222

Int. Cl.[5] F25B *29/00*

U.S. Cl. 165—12 **14 Claims**





1. An air conditioner system for an automotive vehicle comprising:

conditioning air passage means which includes a cooling air source for generating a cooling air, a heating air source for generating a heating air, and a means for controlling the mixing ratio of said cooling and heating air for adjusting temperature of a conditioning air to be discharged into a vehicular cabin;

temperature setting means for allowing manual set of a desired temperature of the conditioning air in said vehicular cabin to produce a first signal having a value indicative of the set temperature;

sensor means for monitoring temperature in said vehicular cabin to produce a second signal having a value indicative of the vehicular cabin temperature;

first control means for adjusting volume flow and temperature of said conditioning air to be discharged into said vehicular cabin depending upon the difference between said first and second signal values, said first control means reducing said volume flow toward a predetermined minimum value, said first control means being active for controlling said conditioning air volume flow and temperature while a difference of said first and said second signal values is not within a predetermined range; and

second control means for increasing volume flow and temperature of said conditioning air to be discharged into said vehicular cabin depending upon the difference between said first and second signal values, said second control means being active when said difference of said first and said second signal values is within said predetermined range, for increasing said conditioning air temperature toward said set temperature from an initial temperature upon detection of said difference within said predetermined range and correspondingly increasing said volume flow from an initial amount upon detection of said difference within said predetermined range so as to maintain a heat value of said conditioning air substantially unchanged.

4,919,196

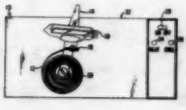
THREE-STAGE MERCURY SWITCH FOR OPERATION BETWEEN THE HEATING AND COOLING MODE

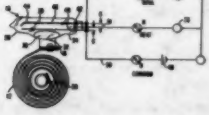
Kalman Podlipnik, 7911 Kennedy Blvd., North Bergen, N.J. 07047

Filed Nov. 28, 1988, Ser. No. 276,652

Int. Cl.[5] G05D *23/08*; F25B *29/00*

U.S. Cl. 165—26 **15 Claims**





9. A thermostat control apparatus for maintaining a desired temperature of a monitored environment comprising:

temperature-responsive means for providing a mechanical displacement from an imaginary horizontal reference line according to changes in the temperature of the environment; and

a mercury switch coupled to said temperature-responsive means including a housing with at least three arcuate pockets having different elevations relative to said horizontal reference line when an upper surface of said bimetallic element is parallel to said horizontal reference line, said at least three arcuate pockets including a first arcuate

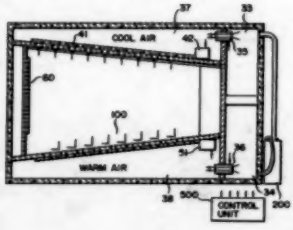
pocket located at the center of said housing having the lowest elevation among said arcuate pockets, said mercury switch further including a common electrode connected to a source of operating potential extending into said housing and across said arcuate pockets, electrodes adapted to correspond to at least two of said at least three arcuate pockets extending into said housing and terminating at said corresponding arcuate pockets, and a pool of mercury located in said housing, said mercury being contained in said first arcuate pocket when said upper surface of said bimetallic element is horizontal relative to said horizontal reference line, said mercury flowing into the arcuate pocket having the lowest elevation relative to the horizontal reference lines when said mercury switch is displaced by said temperature responsive means, said mercury providing a conducting path between said common electrode and said electrode corresponding to said arcuate pocket having said lowest elevation, whereby the difference in relative elevations between said first arcuate pocket and each other arcuate pocket creates a temperature differential between said first pocket and said each other pocket such that the desired temperature has to differ by said temperature differential before mercury flows out of said first arcuate pocket.

4,919,197

ATMOSPHERE CONTROL APPARATUS FOR THEATERS

Kanji Murakami, 7-1-12-102, Minamiaoyama, Minato-ku, Tokyo, Japan

Division of Ser. No. 79,698, Jul. 30, 1987, Pat. No. 4,838,344. This application Jan. 3, 1989, Ser. No. 293,095
Claims priority, application Japan, Sep. 2, 1986, 61-206114
Int. Cl.[5] F25B *29/00*; G03B *21/32*
U.S. Cl. 165—48.1 **3 Claims**



1. An air-conditioner system for air-conditioning a movie heater or other theater, comprising:

storage means for storing temperature conditioned air produced by the operation of an air-conditioner;

blower means for sending the temperature conditioned air from the storage means into an empty space above the ceiling of the audience seating section in a movie theater or other theater;

shutter mechanism means for controlling the flow of the temperature conditioned air discharged toward the audience seating section through holes provided through the ceiling;

a shuttle control motor for driving said shutter mechanism means;

flap means for controlling the blowing direction of the temperature conditioned air, said flaps means being provided below the ceiling and driven by a flap control motor; and

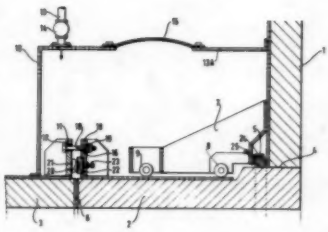
system control means which, in order for the audience to experience the same atmosphere as that in a movie theater scene or other theater scene, controls shutter control and flap control motors in sychronism with data corresponding to the atmosphere in said scene.

4,919,198

DEVICE FOR SEALING AND ABSORBING DIFFERENTIAL EXPANSION BETWEEN A CHAMBER FOR COOLING PARTICLES IN SUSPENSION AND A RECYCLING DUCT

Henri Patron, Rochefort en Yvelines, France, assignor to Societe Anonyme dite: STEIN INDUSTRIE, Velizy-Villacoublay, France

Filed Jun. 2, 1989, Ser. No. 360,817
Claims priority, application France, Jun. 8, 1988, 88 07620
Int. Cl.[5] F28F *7/00*
U.S. Cl. 165—81 **7 Claims**



1. A device for sealing and absorbing differential expansion between a cooling chamber for cooling particles in suspension in a flow of fuel gas and a duct for recycling said particles to a combustion chamber, the device comprising:

(a) a tubular expansion joint part interconnecting the wall of the cooling chamber and the recycling duct, the outside margin of one of the ends of the part being supported by the wall of an opening into the cooling chamber and the cross-section of the other end of the part being supported against the cross-section of the recycling duct;

(b) a plurality of guide plates for guiding the tubular part, said plates being fixed to the outside wall of the cooling chamber and being distributed around the tubular expansion joint part and resting thereagainst by means of rolls, and clamping a sealing ring against the join line between the tubular expansion joint part and the wall of the opening in the cooling chamber;

(c) a flat gasket disposed between the facing cross-sections of the tubular expansion joint part and of the recycling duct; and

(d) flanges for controlled mutual clamping of the facing cross-sections of the tubular expansion joint part and of the duct, said flanges being provided with oblong holes for passing clamping bolts for allowing differential expansion to take place in two perpendicular directions, one of said flanges being provided with pebble-shaped parts each having a plane slip surface on one side facing said flange, and a surface on its other side bearing against a clamping adjustment shoe controlled by a screw passing through the other flange.

4,919,199

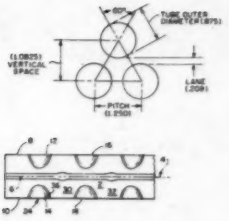
MULTIPLE LOCKING STAKE FOR TUBE BUNDLE

Robert B. Hahn, Virginia Beach, Va., assignor to The Atlantic Group, Inc., Norfolk, Va.

Filed Jan. 13, 1989, Ser. No. 296,592
Int. Cl.[5] F28F *1/00*
U.S. Cl. 165—162 **9 Claims**

1. A multiple locking stake adapted to be driven transversely in a Lane between first and second rows of tubes within a bundle, said stake comprising an elongated metal strip having a longitudinal axis, a bend along said longitudinal axis so as to define a proximate stake midpoint and upwardly extending legs that terminate at a distal end, wherein a plurality of saddles transverse to the longitudinal axis of the stake are formed at longitudinal locations within the distal ends of the legs with

each saddle being separated by a ligament portion, so as to provide spring contact areas against lower surfaces of the first row of tubes and a sliding contact between a lower surface of the stake and upper surfaces of the second row of tubes as the stake is driven along said Lane in the intended use, wherein



each saddle has an upper surface with a radius of curvature equal to or greater than the outer radius of curvature of the tubes of the first row, and each saddle has a transition section between that radius of curvature and a longitudinal surface of each adjacent ligament portion.

4,919,200

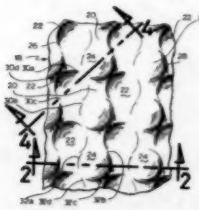
HEAT EXCHANGER WALL ASSEMBLY

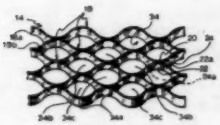
Stanislas Glomski, Chemin de la Rivière, Saint-Félix de Kinsey, Canada (J0B 2T0), and Patrick Roseberry, 3675 Saint-Pierre Street, Drummondville, Canada (J2B 6V2)

Filed May 1, 1989, Ser. No. 345,307

Int. Cl.[5] F28F *3/02*

U.S. Cl. 165—166 **9 Claims**





1. A wall assembly consisting of at least an upper, an intermediate and a lower sheet of a rigid material, each sheet being poked with a plurality of similar protuberances and cavities extending on opposite sides of the virtual plane defined by the sheet in alternating fashion whereby each cavity is surrounded solely by protuberances and each protuberance is surrounded solely by cavities, and securing means to fixedly interconnect said sheets; wherein an upper and a lower layer of channels are defined, undulating in a direction normal to said sheets, each of said channels being of constant cross-section along its entire length .

4,919,201

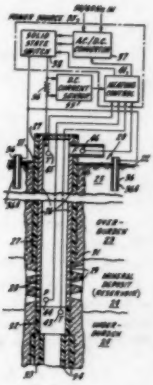
CORROSION INHIBITION APPARATUS FOR DOWNHOLE ELECTRICAL HEATING

Jack E. Bridges, Park Ridge; George T. Dubiel, and Thomas J. Bajzek, both of Wood Dale, all of Ill., assignors to Uentech Corporation, Denver, Colo.

Filed Mar. 14, 1989, Ser. No. 322,912

Int. Cl.[5] E21B *43/24*

U.S. Cl. 166—60 **28 Claims**



1. In an electromagnetic heating system for an oil well or other mineral fluid well, including a main heating electrode located downhole in the well at a level adjacent a mineral fluid deposit, and a return electrode located such that an electrical current between the electrodes passes through and heats a portion of the mineral fluid deposit, an electrical energizing apparatus including an A.C. power source for generating a high amplitude A.C. heating current, of at least fifty amperes, a D.C. bias source for generating a low amplitude D.C. bias current having a given polarity such as to inhibit corrosion at the main electrode, and connection means for applying both the A.C. heating current and the D.C. bias current to the electrodes of the well heating system, the improvement in which the D.C. bias source comprises a bias circuit, connected to a heating circuit that includes the A.C. power source, the bias circuit including at least one semiconductor device and developing a net D.C. voltage differential of the given polarity in response to the A.C. heating current.

4,919,202

SUCKER ROD GUIDE BEARING

Carl Clintberg, 908 - 120 Avenue SE, Calgary, Alberta, Canada (T2J 2K7)

Filed Feb. 8, 1989, Ser. No. 307,478

Int. Cl.[5] E21B *17/10*

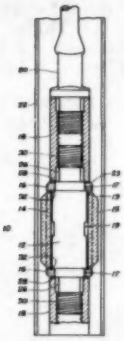
U.S. Cl. 166—176 **5 Claims**

1. A sucker rod guide bearing, attachable at each end by means of a sucker rod coupling to an adjacent section of a sucker rod comprising:

(a) a cylindrical body shaft having a threaded stud at each end and an intermediate cylindrical body of a diameter greater than that of said threaded studs wherein a bearing

end surface is formed between each of said studs and the cylindrical surface of said body to provide a friction surface for torque transfer engagement with a sucker rod coupling end surface;

(b) a vaned cylindrical wheel slidably mountable over said body and having a length slightly less than that of said body; and



(c) wear means for acting as a sacrificial wear surface in the event said wheel is excessively worn or broken including a pair of torque transfer washers, each positionable between one of said bearing end surfaces and a corresponding sucker rod coupling end surface and having a diameter greater than that of said body but less than that of said wheel wherein the material hardness of said washers is less than that of the wall casing material so as to enable said washers to act as alternative sacrificial elements.

4,919,203

METHODS AND APPARATUS FOR FIELD BLASTING OF EARTH FORMATIONS USING INFLATABLE DEVICES FOR SUSPENDING EXPLOSIVES IN BORE HOLES

Daniel F. Fitzgibbon, Jr., Route 3, Van Dyke Mill Road, Taylorsville, Ky. 40071

Filed Mar. 10, 1988, Ser. No. 166,542

Int. Cl.[5] E21B *33/127*

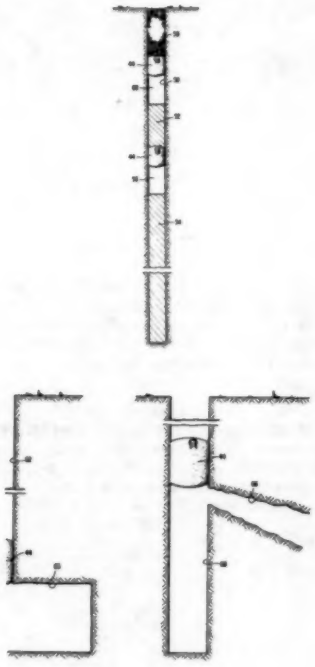
U.S. Cl. 166—187 **20 Claims**

18. A stemming construction for a borehole formed vertically or essentially vertically in the earth and extending through at least one seam of material from which earth is to be removed, comprising:

an inflatable body means comprising flexible portions for extending into contact with walls of the borehole and for transferring pressure from an inflating fluid introduced into the body means to the walls of the borehole, the inflatable body means being positioned in the borehole immediately below the seam of material;

stemming material disposed in the borehole outwardly of the inflatable body means and contacting the body means, the pressure of the inflating fluid being adequate to provide an essentially vertical force component directed against the stemming material to support said material, the stemming material extending within the borehole a distance substantially equal to the depth or height of the seam of material; and,

explosive material disposed in the borehole outwardly of the stemming material and contacting the stemming material, the explosive material being located substantially above



the seam of material, the inflatable body means supporting the stemming material and the explosive material.

4,919,204

APPARATUS AND METHODS FOR CLEANING A WELL

Walter Baker, Lewisville, and Malcolm N. Council, Richardson, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Jan. 19, 1989, Ser. No. 298,688

Int. Cl.[5] E21B *37/00*

U.S. Cl. 166—223 **14 Claims**

1. A system for cleaning the inside diameter of well tubulars comprising:

a. a work string disposed within the well tubular;

b. means for longitudinally moving the work string within the well tubular;

c. means for supplying power fluid to the work string;

d. fluid jet cleaning apparatus attached to the end of the work string within the well tubular;

e. the jet cleaning apparatus having an inner mandrel and an adapter to connect the apparatus to the work string;

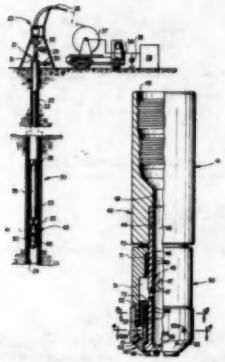
f. a housing rotatably carried on the exterior of the inner mandrel;

g. a fluid flow path from the work string to the housing via the inner mandrel;

h. a nozzle body attached to the housing and in fluid communication therewith;

i. a pair of jet nozzles machined into the nozzle body diametrically opposite from each other and oriented to project power fluid essentially tangential to the nozzle body

whereby power fluid exiting from the pair of jet nozzles will cause rotation of the housing and the nozzle body to remove deposits from the inside diameter of the well tubular; and



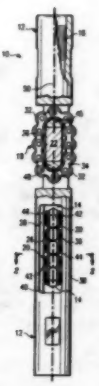
j. the longitudinal moving means comprising a coil tubing injector.

4,919,205

FRICTION-REDUCING DEVICE

William W. Dollison, 4206 Alta Vista La., Dallas, Tex. 75229

Filed Nov. 27, 1989, Ser. No. 441,827
Int. Cl.[5] E21B *17/10*
U.S. Cl. 166—241 12 Claims



1. A sucker rod coupling adapted to reduce friction within production tubing in a well bore, said coupling comprising a substantially cylindrical body member and a plurality of roller assemblies;

said body member comprising means at each end thereof for attaching said coupling to a sucker rod, and a plurality of axially and circumferentially spaced recesses, each recess containing a roller guide connected to said body, and each recess being further adapted to receive and support a roller assembly around said roller guide in such manner that said roller assembly can revolve around said roller guide;

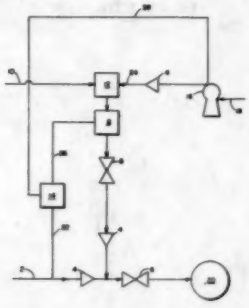
said roller assemblies each comprising a plurality of rollers rotatably mounted on and linked by a chain, said rollers being adapted to reduce frictional contact between said body member and said tubing by rotating between said roller guide and said tubing while said chain revolves around said roller guide.

4,919,206

METHOD FOR PREVENTING BITUMEN BACKFLOW IN INJECTION WELLS WHEN STEAM INJECTION IS INTERRUPTED

D. C. Freeman, Dallas, and N. F. Djabbarah, Richardson, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 19, 1989, Ser. No. 381,930
Int. Cl.[5] E21B *43/24, 47/06*
U.S. Cl. 166—252 20 Claims



1. A method for preventing viscous hydrocarbonaceous fluids from backflowing into a well upon interruption of a steamflood comprising:

(a) detecting a substantial reduction in steam injection pressure in at least one injection well via a pressure sensing device; and

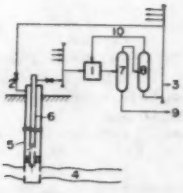
(b) causing automatically a pressurized fluid to be injected into said injection well in response to the reduction in pressure which prevents viscous hydrocarbonaceous fluids from backflowing into the injection well.

4,919,207

METHOD FOR DRAWING UP SPECIAL CRUDE OIL

Yoshiaki Ikuta; Masayuki Moriwaki, both of Tokyo, and Masato Kaneko, Hiroshima, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 65,786, Jun. 24, 1987, abandoned. This application May 22, 1989, Ser. No. 354,457
Claims priority, application Japan, Jun. 25, 1986, 61-146835
Int. Cl.[5] E21B *43/40*
U.S. Cl. 166—267 5 Claims



1. A method for drawing up a special crude oil comprising the steps of:

(1) mixing an extractant oil with a crude oil selected from the group consisting of crude oils containing a great deal of

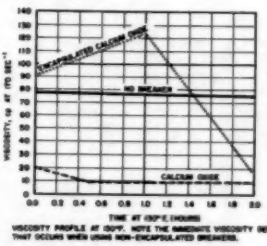
wax and high viscosity crude oils which have been drawn up from an oil well to extract a gas oil therefrom;
(2) separating the mixture from step (1) into:
(a) a mixture of gas oil and an extractant oil; and
(b) a heavy oil;
(3) separating mixture (a) obtained in step (2) into an extractant oil fraction and a gas oil fraction and injecting a part of the separated gas oil into the oil well; and
(4) recycling the extractant oil obtained from step (3) into the extractant oil of step (1).

4,919,208
METHOD AND APPARATUS FOR MANIPULATING TUBING IN A WELL
Chris K. Schneider, P.O. Box 2214, Matthews, N.C. 28106
Filed Sep. 11, 1987, Ser. No. 96,127
Int. Cl.[5] E21B *33/14*
U.S. Cl. 166—286 **16 Claims**

11. A method for cementing a tubular casing in a wellbore comprising (1) inserting said casing string in said well bore, (2) causing a section of the casing to be out of alignment with a portion of said casing and off-center relative to said wellbore independent of any axial movement of said casing or of any axial movement of any device attached to said casing to create an area of largest standoff, and (3) shifting said area of largest standoff at least partly around the circumference of the wellbore while pumping cement into the annulus between the wellbore and the casing wherein said casing is caused to be off-center as a result of at least one decentralizer secured around a section of the casing, said decentralizer having dimensions sufficient to contact the wall of said well bore and force the casing off-center relative to said well bore, said at least one decentralizer further having at least one axial opening which will allow cement to flow past said decentralizer and wherein said area of largest standoff is shifted as a result of rotation of said casing about the axis of said casing.

4,919,209
METHOD FOR TREATING SUBTERRANEAN FORMATIONS
Milton T. King, Tulsa, Okla., assignor to Dowell Schlumberger Incorporated, Tulsa, Okla.
Filed Jan. 17, 1989, Ser. No. 297,812
Int. Cl.[5] E21B *43/26*
U.S. Cl. 166—300 **14 Claims**

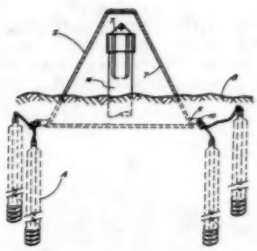
1. A method for breaking a gelled oil fracturing fluid which comprises injecting into a subterranean formation controlled release breaker capsules comprising an enclosure member enclosing a breaker for the gelled oil fracturing fluid; the enclosure member, being water-insoluble and oil-permeable, dissolving upon exposure to at least one fluid existing in the subterranean environment or injected with said controlled release breaker capsules such that the enclosure member is



VISCOSITY PROFILE AT 150°F. NOTE THE IMMEDIATE VISCOSITY INCREASE THAT OCCURS WHEN USING NON-ENCAPSULATED BREAKERS.

capable of releasing the breaker upon sufficient exposure to the fluid.

4,919,210
SUBSEA WELLHEAD PROTECTION SYSTEM
Louis E. Schaefer, Jr., 313 Wright Ave., Gretna, La. 70056
Filed Sep. 30, 1988, Ser. No. 252,502
Int. Cl.[5] E21B *33/037*
U.S. Cl. 166—356 **15 Claims**



1. An apparatus for protecting an underwater abandoned wellhead having an open top, said apparatus comprising:
a wellhead shelter,
said shelter comprising a hollow structure of a size and configuration to substantially envelope the underwater abandoned wellhead,
said shelter further comprising a base and vertically ascending exterior walls having sloping undersides capable of sheltering the wellhead from undersea commerce and preventing undersea commerce from becoming entangled in said shelter or wellhead, and
a supplemental centering cap associated with said shelter and placeable on top of the wellhead before said shelter is lowered over the wellhead, said cap having a lower portion and an upper portion, said upper portion having a base and upper sloping side edges, said lower portion having a lesser width than said base of said upper portion allowing it to be placed into the open top of the wellhead, said base of said upper portion having a greater width than the width of the top of the wellhead allowing said cap to rest on and be stably supported by the top of the wellhead with said lower portion extending into the wellhead, said upper sloping side edges being capable of engaging the sloping undersides of said walls of said shelter to cause said shelter to be centered about the top of the wellhead as said shelter is lowered down about the wellhead.

9. A method of protecting an abandoned wellhead and immediate area on a sea bottom, so that the wellhead and area do not pose a hindrance to undersea commerce, such as trawling,

fishing, and the like, said method comprising the following steps:

a. prefabricating a protective structure having exterior walls designed to envelope and protect that portion of the abandoned wellhead protruding up from the surface of the sea bottom, with the walls being made of a series of separate, rigid, extended surface wall sections, which are separately made and handled during prefabrication and are ultimately used at the wellhead site to form the walls of the protective structure;

b. transporting said structure from the fabrication site to the installation, wellhead site with at least some of said separate wall sections being in unassembled, separated form;

c. assembling together the unassembled wall sections, forming the prefabricated structure at the abandoned wellhead, installation site prior to installation;

d. preparing the wellhead site, including excavating a portion of the sea bottom immediately surrounding the wellhead, so that the excavation is sufficiently large and deep enough to encompass the bottom of the protective structure, while allowing said structure to envelope said wellhead;

e. adding a rigid centering cap having downwardly sloping side edges on top of the wellhead with the centering cap being supported by and on top of the wellhead;

f. lowering the assembled structure over said wellhead and onto the base of the excavation, simultaneously centering said structure relative to said wellhead;

g. centering the structure with respect to the top of said wellhead using the engagement of the undersides of said structure bearing down against said downwardly sloping side edges as the structure is lowered; and

h. covering the bottom of said lowered assembled structure with said excavated material, anchoring and strengthening the protective structure around the wellhead, reducing the likelihood of undersea commerce being entangled with the wellhead and immediate area.

4,919,211
CLOD CRUMBLER

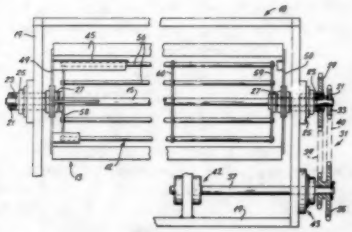
Richard E. Cope, Bedford, England, assignor to National Research Development Corporation, London, England

Filed Jul. 29, 1988, Ser. No. 225,895

Claims priority, application United Kingdom, Jul. 30, 1987, 8718122

Int. Cl.[5] A01B *29/06*

U.S. Cl. 172—69 **8 Claims**



1. A rotary clod crumbler device mounted for forward movement along the ground, the device comprising inner and outer soil-treatment rotors mounted for rotational movement about a common axis lying transversely to the direction of forward movement of the device, the outer rotor having elongate soil-engaging parts extending transversely to the direction of forward movement of the device, the inner rotor having soil-engaging parts extending radially of the common axis and drive means operative to drive the inner rotor in the same rotational sense as the outer rotor but at a different peripheral speed thereby to impose shearing forces on soil simultaneously engaged by the parts of the two rotors.

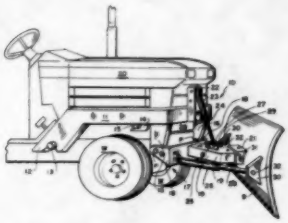
4,919,212
TRACTOR MOUNTING FOR A DOZER BLADE

Ronald G. McClure, R.D. #2, Box 43A, Columbia Crossroads, Pa. 16914

Filed Apr. 10, 1989, Ser. No. 335,647

Int. Cl.[5] E02F *3/76*

U.S. Cl. 172—274 **9 Claims**



1. A quickly attachable and detachable tractor mounting assembly for a dozer blade that has a pivotable lifting axis above and in front of a front wheel axis to provide undercarriage clearance and improved lift for said dozer blade, comprising:

a generally U-shaped cradle releasably mounted about front and sides of a body portion of said tractor, and substantially surrounding said body portion;

means defining a pivot supported by said cradle and disposed in front of and above said front wheel axis of a tractor to provide undercarriage clearance and improved dozer blade lift angle;

a dozer blade attachment comprising a generally U-shaped assembly pivotably supported by said U-shaped cradle about said means defining said pivot, and including a forwardly extending dozer support arm angled in a mid-portion thereof; and

lifting means supported by said cradle and pivotably secured to said dozer blade attachment for lifting said dozer blade attachment and a dozer blade secured thereto.

4,919,213
GARDEN ROLLER TOOL WITH ADJUSTABLE TELESCOPIC ARMS

William M. Searle, Box 67 Rte. 1, Edwards, Ill. 61528, and George Spector, 233 Broadway Rm. 3615, New York, N.Y. 10007

Filed Jan. 23, 1986, Ser. No. 821,752

Int. Cl.[5] A01B *1/20*

U.S. Cl. 172—350 **1 Claim**

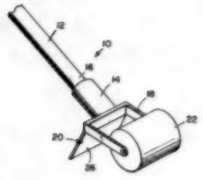
1. A garden roller tool which comprises:

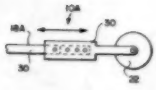
(a) an elongated handle having inner and outer ends;

(b) a ferrule affixed longitudinally to the outer end, said ferrule having a forked end and a generally transverse implement extending therefrom between said forked end and said outer end of said handle;

(c) a weighted roller journaled on said forked end of said ferrule outward of said implement so that in one position when said handle is tilted downwardly, said roller is elevated applying pressure on said implement as a fulcrum to push said implement into the ground and in another position when said handle is raised upwardly said roller is lowered to engage the ground, releasing pressure on said implement, whereby said roller acts as a fulcrum in raising said implement from the ground allowing said roller to roll over the ground freely, wherein said forked end of said ferrule includes a pair of adjustable telescopic arms

with said weighted roller journaled thereto so that movement of said telescopic arms will vary the distance of said





roller from said implement so that when said roller is lifted upwardly from the ground the pressure applied to said implement will vary.

4,919,214

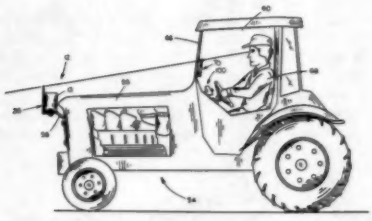
CENTERLINE SIGHT

Sam J. Brown, Rural Route 3, Cozad, Nebr. 69130

Filed Apr. 17, 1989, Ser. No. 339,381

Int. Cl.[5] A01B *69/00*

U.S. Cl. 172—430 **6 Claims**



1. In combination:

A tractor having forward and rearward ends, and a forwardly facing operator seat mounted thereon; a centerline sight device including:

a sight arm housing mounted on the forward end of said tractor;

a sight arm operably mounted to said housing for transverse movement with respect to the longitudinal axis of the tractor;

motor means within said sight arm housing for selectively moving said sight arm in one transverse direction or the other;

a lamp assembly housing mounted on said tractor forwardly of said seat and rearwardly of said sight arm;

said lamp housing having a plurality of lamps along its top, spaced apart, and oriented transversely to the longitudinal axis of the tractor;

operable control means electrically connecting said lamps with said motor means;

switch means associated with each said lamp, electrically connected to said control means;

said control means adapted to operate said motor means to move said sight arm to a predetermined position, and to illuminate a predetermined lamp, upon actuation of the associated switch means, such that a line of sight through said illuminated lamp and through said sight arm will intersect a longitudinal marker aligned under the longitudinal centerline of the tractor, whereby the tractor may be maintained in centered relation over the longitudinal marker by steering the tractor to align said marker with said sight line.

4,919,215

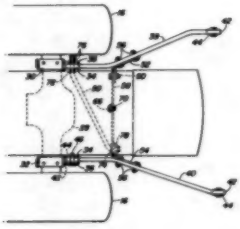
HITCH WITH ANTI-SWAY LINK

Michael C. Lee, Beaver Dam, and Dale R. Dobberpuhl, Horicon, both of Wis., assignors to Deere & Company, Moline, Ill.

Filed Mar. 22, 1989, Ser. No. 327,282

Int. Cl.[5] A01B *59/041;* **A01D** *34/24*

U.S. Cl. 172—450 **3 Claims**



1. Lift structure for connecting an implement to a vehicle including first and second mounting arms having first ends pivotally connected to the vehicle at transversely spaced locations for vertical movement about a common axis and second ends for connection to an implement, power means acting between the vehicle and mounting arms for vertically moving the mounting arms about the common axis, and an anti-sway linkage for limiting lateral swinging movement of the mounting arms, characterized in that the anti-sway linkage is a single, one-piece, rigid link having one end secured to the first mounting arm at a location spaced from the pivotal connection between the vehicle and first mounting arm and a second end pivotally connected to the vehicle at a location closer to the location of the pivotal connection between the vehicle and second mounting arm than the location of the pivotal connection between the vehicle and first mounting arm, a portion of the single rigid link has a substantially circular cross section and extends along and moves about the common axis as the first mounting arm is moved vertically about the common axis.

4,919,216

AUTOMATIC IMPACT DRIVER

Kazunori Ikegami, 6-30, Minami-Honmachi 5-chome, Yao-shi, Osaka, Japan

Filed May 22, 1989, Ser. No. 354,555

Claims priority, application Japan, Mar. 2, 1989, 64-151433

Int. Cl.[5] B25B *21/02*

U.S. Cl. 173—93.6 **2 Claims**

1. An automatic impact driver comprising:

a cylindrical casing open at one end and closed at the other end by a cylindrical cap;

a hammer block fitted in said casing so as to be freely movable in an axial direction;

a coil spring fitted in said casing between said hammer block and said cylindrical cap so as to urge said hammer block toward said open end;

a cylindrical slider fitted in an inner peripheral surface of said casing at the open end thereof so as to be freely movable in an axial direction, said casing including rotation prevention means for preventing rotation of said

slider in said casing and means for retaining said slider within said casing;

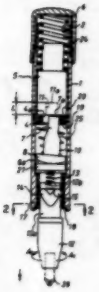
a chuck for gripping a bit fitted in an inner peripheral surface of said slider so as to be rotatable and moveable in an axial direction therein;

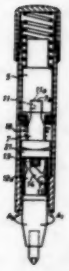
a cam mechanism installed between said chuck and said slider for converting axial motion of said slider relative to said chuck into rotary motion of the chuck;

a plunger disposed between said slider and said hammer block and movable in the axial direction for transmitting an impact of said hammer block to said slider;

a recessed part including a hammer face formed in a surface of said hammer block fronting on a top wall of said plunger, which top wall is formed to fit into said recessed part;

a holding mechanism between said plunger top wall and said hammer block to prevent said top wall from entering said recessed part as said casing is urged toward said hammer block to compress said coil spring thereagainst; and





a releasing mechanism for releasing said holding mechanism when the casing has moved relative to said hammer block and said plunger so as to compress said coil spring, such that said hammer block urged by said coil spring is released to impact said plunger top wall with said hammer face, said impact causing said slider to be moved axially whereby said chuck and bit are caused to rotate by said cam mechanism;

wherein a V-shaped cam groove is formed on an outer peripheral surface of the chuck, a ball holding hole is formed in the slider, a ball held rotatably in said ball holding hole is fitted in the cam groove so as to compose the cam mechanism, an eccentric coil spring is fitted onto an outer peripheral surface of the plunger so as to compose the holding mechanism, a top wall of the plunger is made to contact with a bottom face of the hammer block by said eccentric coil spring so that a holding state is created, a tapered cam surface increasing in its diameter downwardly is formed on an intermediate portion of an outer peripheral surface of the plunger, a neck for guiding said tapered cam surface is formed on an inner peripheral surface of the casing so as to compose the releasing mechanism, and the tapered cam surface is guided by an inner peripheral face of the neck as the plunger comes up within said neck so that the plunger top wall is fitted in the recessed part of the hammer block.

4,919,217

OPTICAL FIBER-CONTAINING INSULATORS AND PRODUCING PROCESS THEREOF

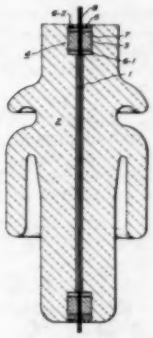
Toshiyuki Mima, and Hideki Shimizu, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

Filed Jun. 20, 1989, Ser. No. 368,595

Claims priority, application Japan, Aug. 10, 1988, 63-197829

Int. Cl.[5] H01B *17/00*; G02B *6/00*

U.S. Cl. 174—139 **2 Claims**



1. An optical fiber-containing insulator comprising an insulator body having a through hole provided in a central portion thereof, an optical fiber inserted into said through hole, a stepped portion formed in the through hole at at least one end of the insulator body, a sealing section consisting of a pair of holders provided at upper and lower ends of the stepped portion and an inorganic glass layer sandwiched between the holders, and a protective layer formed on the outer holder.

4,919,218

PROCESS FOR REESTABLISHING CIRCULATION IN A LOST RETURN ZONE

James M. Williams, 404 Academy St., Houma, La. 70360

Filed Jan. 25, 1989, Ser. No. 301,624

Int. Cl.[5] E21B *7/00*

U.S. Cl. 175—72 **10 Claims**

1. A process for establishing recirculation down a borehole of drilling mud, following the collapse of the formation wall and the loss of mud into the formation to create a no return zone, the process comprising the following steps:

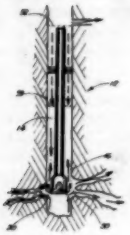
(a) establishing a drop of drilling mud within the annulus of the borehole, so that no drilling mud is returned to the surface during the drilling process;

(b) introducing a quantity of lighter weight fluid into the borehole, of such a reduced weight as to prevent further collapse of the formation wall, and in order to compensate for the drop of mud into the borehole, the fluid introduced substantially to the level of the surface of the borehole;

(c) closing off the upper end of the borehole, so that no fluid may flow out of the borehole;

(d) introducing additional lighter weight fluid into the borehole, so that the additional fluid will force the drilling mud into the loss return zone down the borehole;

(e) finding the pressure differential between the level of mud in the borehole in step (a), and the amount of fluid introduced into the borehole after the closing off of the borehole;



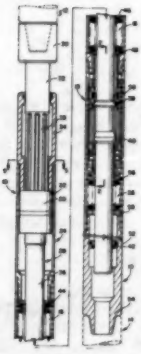
(f) calculating the weight of lighter weight fluid necessary to introduce into the borehole so as to enable the formation to hold the weight of the lighter weight fluid so that recirculation can be established within the borehole.

4,919,219

REMOTELY ADJUSTABLE FISHING JAR

William T. Taylor, P.O. Box 309, Warren, Tex. 77664

Filed Jan. 23, 1989, Ser. No. 299,227
Int. Cl.[5] E21B *31/107*
U.S. Cl. 175—299 **12 Claims**



1. A remotely adjustable downhole fishing jar apparatus comprising:

(a) an operating mandrel reciprocatively mounted within a housing body with said mandrel and said body adapted to be connected into a well bore operating string;

(b) said mandrel and said body forming an impact hammer and an impact anvil for creating an upwardly directed impact force;

(c) an impact release spring adapted to be compressed between said mandrel and said body responsive to tension applied to said mandrel by said operating string;

(d) a releasable lug array latching means connected between said mandrel and an adjustable loading adjustment sleeve for compressing said release spring a designated distance with a designated movement of said mandrel until said lug array is released when moved past a release position set by said loading adjustment sleeve;

(e) said sudden release of said impact release spring translating to sudden upper movement of said mandrel responsive to the tensional force in said operation string to cause impact of said hammer with said anvil;

(f) said loading adjustment sleeve being adjustably threaded into said housing body for rotation to cause designated changes in compressional force in said release spring proportionate to changes in longitudinal position of said adjustment sleeve;

(g) said adjustment sleeve forming a continuous elongated reciprocation cam slot formed to cause rotation of said adjustment sleeve responsive to longitudinal reciprocation of adjustment cam lug within said cam slot; and

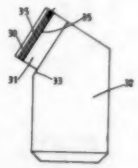
(h) a preset sleeve mouned around said mandrel and forming at least one said cam lug to cause said cam lug to reciprocate within said slot when said mandrel is longitudinally moved from a relatching and release position used to operate said jar into a separate reset position where said cam lug can be reciprocated.

4,919,220

CUTTING STRUCTURES FOR STEEL BODIED ROTARY DRILL BITS

John Fuller, Penzance, Cornwall, and Michael C. Regan, Robinswood, Gloucester, both of England, assignors to Reed Tool Company, Ltd., London, England

Continuation-in-part of Ser. No. 118,604, Nov. 9, 1987, Pat. No. 4,823,892, which is a division of Ser. No. 754,506, Jul. 12, 1985, Pat. No. 4,718,505. This application Jan. 25, 1988, Ser. No. 148,072
Int. Cl.[5] E21B *10/46*
U.S. Cl. 175—329 **18 Claims**



1. A rotary drill bit for use in drilling or coring holes in subsurface formations, comprising a bit body having a shank for connection to a drill string, a plurality of cutting structures mounted at the surface of the bit body, and a passage in the bit body for supplying drilling fluid to the surface of the bit body for cooling and/or cleaning the cutting structures, the bit body being formed from steel, at least one of the cutting structures comprising a cutting element, in the form of a preformed unitary layer of polycrystalline diamond material which is thermally stable up to a temperature higher than 750° C., the pre-formed layer being bonded to a carrier received in a socket in the steel body of the bit.

4,919,221

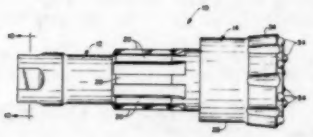
IMPACT DRILL BIT ASSEMBLY AND REPLACEABLE PARTS THEREOF

Jack H. Pascale, Bloomsbury, N.J., assignor to Numa Tool Company, Thompson, Conn.

Filed Apr. 6, 1989, Ser. No. 333,903
Int. Cl.[5] E21B *10/52*
U.S. Cl. 175—415 **22 Claims**

1. For use in a downhole impact drill having an elongated pneumatic impact hammer with an impact bit at one end thereof and a backhead at the other end thereof for coupling the downhole hammer to a drill string used to supply air under pressure for pneumatic operation of the hammer and to urge the hammer inwardly and rotate the hammer in one angular direction during downhole drilling, the impact bit having a drive shank with an anvil end face at one end thereof, and the hammer having an impact piston pneumatically reciprocable to

impact the anvil end face at a high frequency for downhole impact drilling, an impact bit for a downhole hammer comprising an assembly of an elongated male drive shank having external, shank drive splines for rotation of the drive shank by the hammer in said one angular direction during drilling, a said anvil end face at one end thereof and an impact end face at the opposite end thereof and an enlarged female impact head mounted on said opposite end of the drive shank and engageable by the downhole hammer to be urged inwardly thereby during drilling, the impact head having an impact cap with an inner impact face engageable by the impact end face of the drive shank and an upstanding collar for receiving said opposite end of the drive shank, the drive shank and upstanding collar having cooperating annular arrangements of equiangularly spaced, external and internal, head drive splines respectively, extending generally helically away from the respective



impact faces in an angular direction opposite to said one angular direction to urge said opposing impact faces into engagement by rotation of the drive shank in said one angular direction during drilling, the collar having an internal annulus and the drive shank having a circular arrangement of locking lugs received within the annulus, the drive shank lugs cooperating with the collar for locking the head against axial withdrawal from the drive shank in one relative angular position thereof, the circumferential width and spacing of the head drive splines permitting the head to be axially inserted on the shank and then rotated to said one relative angular position, the bit assembly further comprising elongated key inserts between the enternal and internal, head drive splines to form therewith a drive coupling for rotation of the impact head by the drive shank, the key inserts being inserted between the splines in said one relative angular position of the head and shank and preventing relative rotation of the head and shank therefrom.

4,919,222

DYNAMIC PAYLOAD MONITOR

Christos T. Kyrtsos, and Dean A. Worrell, both of Peoria, Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Mar. 15, 1989, Ser. No. 324,517

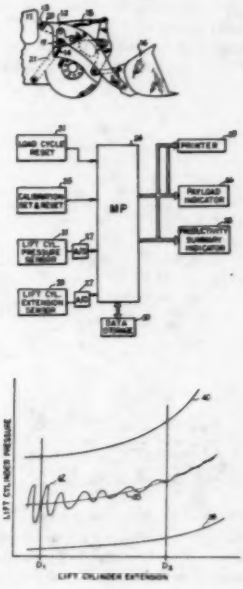
Int. Cl.[5] G01G *19/08, 19/10, 19/40*

U.S. Cl. 177—139 **20 Claims**

1. An apparatus for dynamically measuring and indicating payload weight for a vehicle having at least one implement linkage including a linkage connection pivot pin, and at least one cylinder for modifying said implement linkage geometry, said apparatus comprising:

means for delivering a first signal in response to sensing the hydraulic pressure of said cylinder;

means for delivering a second signal in response to sensing rotation of said implement linkage about said linkage connection pivot pin; and



means for deriving payload weight in response to said first and second signals.

4,919,223

APPARATUS FOR REMOTELY CONTROLLED MOVEMENT THROUGH TUBULAR CONDUIT

Shawn E. Egger, 7779 W. Dead Creek Rd., Baldwinsville, N.Y. 13027, and Harold G. Sherman, Baldwinsville, N.Y., assignors to Shawn E. Egger, Baldwinsville, N.Y.

Continuation-in-part of Ser. No. 144,118, Jan. 15, 1988, abandoned. This application Mar. 27, 1989, Ser. No. 328,685

Int. Cl.[5] B62D *57/02*

U.S. Cl. 180—8.1 **10 Claims**

1. Apparatus for controlled movement through the interior of an elongated, tubular conduit having both linear and curved sections, said apparatus comprising, in combinatin:

(a) first and second stepping members each including rigid frame disposed about a central axis, and frictional engagement mounted upon said frame and movable with respect thereto between outwardly expanded and inwardly retracted positions relative to said central axis;

(b) means for moving said frictional engagement means of each of said stepping members between said outwardly extended and retracted positions for frictional engagement with and disengagement from the inside surface of said conduit;

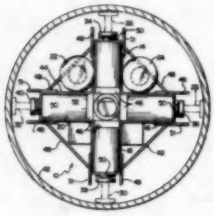
(c) axial drive means rigidly connecting said first and second stepping members in spaced relation for relative movement along said central axis;

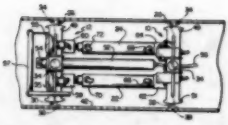
(d) said axial drive means comprising at least one extensible and retractable member rigidly connected at opposite ends to said rigid frames of said first and second stepping members, respectively; and

(e) the frictional engagement of said engagement means with said inside surface of said conduit and the forces moving

said engagement means to said outwardly extended position and moving said at least one extensible and retractable member to its extended position being such that:

(i) said frictional engagement of said engagement means of each stepping member will support the remainder of the apparatus in spaced relation to said inside surface of said conduit, without significant slippage, during movement through linear sections of said conduit; and





(ii) said frictional engagement permits slippage of said engagement means of each stepping member upon said inside surface of said conduit to permit limited rotation of said apparatus about an axis transverse to the axis of said conduit in response to movement of said extensible and retractable member to its extended position during movement through curved sections of said conduit.

4,919,224

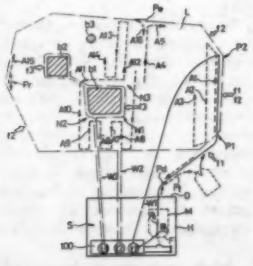
AUTOMATIC WORKING VEHICULAR SYSTEM

Jia-Ming Shya, and Chih-Li Chang, both of Hsin Chu Hsien, Taiwan, assignors to Industrial Technology Research Institute, Hsin Chu Hsien, Taiwan

Filed May 9, 1988, Ser. No. 191,974

Int. Cl.[5] B60T *7/16*

U.S. Cl. 180—168 **9 Claims**



1. An automatic working vehicular system comprising:

(1) a guiding signal device comprising:

a signal generator for generating a plurality of alternating currents having at least three different frequencies;

a first wire carrying an alternating current at a first frequency, said first wire loops from said signal generator at a parking location to a first corner of a job site and along one side of the job site to a second corner thereof and back to said signal generator;

a second wire carrying an alternating current at a second frequency, said second wire loops from said signal generator at the parking location and around an external circumference of the job site and back to said signal generator;

a third wire carrying an alternating current at a third frequency, said third wire loops from said signal generator at the parking location and around an external circumference of each barrier area located within the job site; and

(2) an automatic working vehicle comprising:

a frame having a front end, a rear end, and two sides;

a travelling mechanism for turning said frame and moving said frame forwards, backwards, and sideways;

a dynamic source for driving said travelling mechanism;

an electric power source for storing and supplying a required power;

a timer for providing a starting signal enabling said vehicle to begin operating at a desired time;

a plurality of wire sensors for sensing a signal from said guiding signal device and producing a wire location signal;

a distance measuring device for measuring a distance between said vehicle and obstacles and producing an obstacle signal;

a margin sensor mounted for sensing a boundary location between an already operated area and a non-operated area and producing a boundary location signal;

a microcomputer, having stored control programs, for controlling the operation of said vehicle; wherein said vehicle starts automatically when it receives said starting signal, and according to said guiding signal device, travels from the parking location to the job site, operates over the job site in a parallel reciprocating manner, and returns to the parking location.

4,919,225

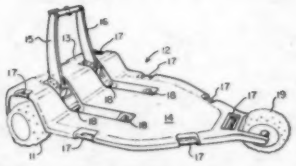
PLATFORM ORIENTED TRANSPORTATION VEHICLE

Daniel D. Sturges, 23240 Deerfield Rd., Los Gatos, Calif. 95030

Filed Mar. 31, 1988, Ser. No. 175,815

Int. Cl.[5] B62D *61/06*

U.S. Cl. 180—210 **19 Claims**



1. A three wheel vehicle, comprising;

three ground engaging wheels, two of said wheels being rotatably aligned on a first horizontal axis, and said third wheel being rotatable about a second horizontal axis of rotation that is spaced from and parallel to said first axis of rotation,

a generally flat platform adapted to support a vehicle operator and having means for suspending said wheels therefrom,

a plurality of means for removably attaching elements to said platform at spaced locations around the perimeter of said platform,

a control pedestal extending generally vertically upward from said platform in a position for manual access by the operator, whether the operator is standing or sitting relative to said platform, and

means for locating and securing said control pedestal between a first position for use by a standing operator, a second position for use by a sitting operator, and a third

position wherein said pedestal extends closely adjacent to and substantially parallel with said flat platform,

whereby the vehicle is vertically storable when said pedestal is pivoted into said third position and said flat platform is pivoted to a generally vertical position, as said platform rotates about said first axis of rotation.

4,919,226

MOTOR VEHICLE WITH A DEVICE FOR THE RELEASE OF THE FUEL TANK IN THE EVENT OF A VIOLENT IMPACT TO THE REAR

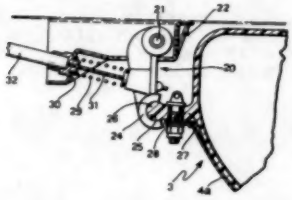
Avtar Singh Rana, Turin, and Romolo Gandiglio, Asti, both of Italy, assignors to Fiat Auto S.p.A., Turin, Italy

Filed Nov. 2, 1988, Ser. No. 266,422

Claims priority, application Italy, Nov. 2, 1987, 67921 A/87

Int. Cl.[5] B60K *15/02*

U.S. Cl. 180—274 **6 Claims**



1. A motor vehicle having a fuel tank mounted under the body, including

first support means, including at least one movable support member for the tank which can be moved between a first position in which the movable support member supports the tank and a second position in which the movable support member is disengaged from the tank, causing the tank to move downwardly,

sensor means for detecting an impact against the rear part or the motor vehicle, and

actuator means for causing diplacement of said at least one movable support member towards its second position when the sensor means detect an impact greater than a predetermined magnitude.

4,919,227

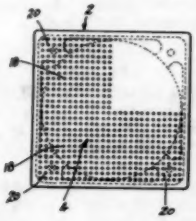
TAMPER RESISTANT SPEAKER GRILLE FOR INTERCOM MODULE

Troy R. Chicoine, New Britain, Conn., assignor to Otis Elevator Company, Farmington, Conn.

Filed Jun. 8, 1989, Ser. No. 363,002

Int. Cl.[5] G10K *11/00*

U.S. Cl. 181—175 **7 Claims**



1. A tamper-resistant speaker grille assembly comprising:

(a) a cover member which fronts ambient surroundings of the grille assembly, said cover member being provided with a plurality of small sound transmitting holes therein;

(b) an insert member juxtaposed to said cover member, and telescoped into a recessed area in said cover member, said insert member being provided with a plurality of additional small sound transmitting holes, wherein none of the sound transmitting holes in the cover member are coaxial with any of the sound transmitting holes in the insert; and

(c) a plurality of lug means equiangularly spaced about said cover member recessed area, and a plurality of locating tab means equiangularly spaced about a periphery of said insert member, said tab means being operable to engage any of said lug means to secure said insert member against angular rotation in said cover member recessed area, and said insert member being thus securable in said cover member recessed area in a plurality of different angular orientations to simplify assemblage of said grille assembly.

4,919,228

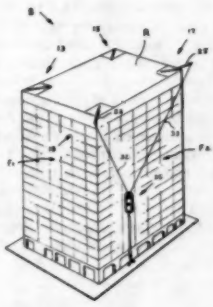
RESCUE SYSTEM FOR TALL BUILDINGS

Alexander Stefan, 216 E. Arby Ave., Las Vegas, Nev. 89119

Filed Jan. 13, 1989, Ser. No. 296,932

Int. Cl.[5] A62B *1/02*

U.S. Cl. 182—14 **15 Claims**



1. System for rescuing occupants of a tall building, which building has at least a first generally planer face, said system comprising:

(a) at least a first and second boom, each mounted at an upper level of said building at opposite sides of said first building face and each being movable from a retracted position to an operative position with its outer end spaced outwardly of said first building face;

(b) a first hoist cable extending downwardly from the outer end of said operative first boom and a second hoist cable extending downwardly from the outer end of said operative second boom;

(c) collapsible, protective cage having a top wall to which is mounted means for engaging said first and second hoist cables, said cage including at least a first lower wall joined to said top wall by a plurality of flexible elongate support members extending from the periphery of said top wall to the periphery of said at least first lower wall, and flexible, heat-resistant material extending from the periphery of said top wall to the periphery of said at least first lower wall, said cage having an operational configuration in which it is suspended adjacent said building face by said first and second cables and in which said support members and flexible material are extended and said at least first lower wall lies spaced parallel to and below said top wall so as to define a heat-shielded compartment, said extended material having a collapsible doorway therein; and said cage having a collapsed configuration in which said top and said at least first lower wall lie in close proximity with

said support members and flexible materials collapsed therebetween; and

(d) cable driving means for varying the extended lengths of said first and second hoist cables whereby said cage is maneuverable laterally, vertically and obliquely across said building face.

4,919,229

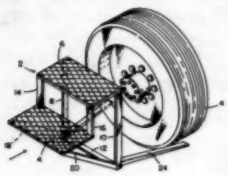
STABLE WORKING PLATFORM

David E. Wells, 1617 East Badger Rd., Everson, Wash. 98247

Continuation-in-part of Ser. No. 130,008, Dec. 8, 1987, abandoned. This application Aug. 29, 1988, Ser. No. 237,971

Int. Cl.[5] E06C 7/46

U.S. Cl. 182—17 9 Claims



1. A stool for use when working upon the engine of a vehicle or the like, said stool receiving its stability from interaction with the tire of the vehicle, said stool comprising:

a substantially rectangular vertical framework wherein the uppermost framework element is horizontal and of greater depth than the remainder of the framework and serves a rigid step extending to one side of the framework,

a pair of feet, one mounted to each vertical element of the framework, adjacent to but spaced from the end opposite from the step and extending in a direction opposite the step, said feet angled outwardly and downwardly whereby when the step is placed adjacent the tire of the vehicle with the feet straddling said tire weight or movement on the step interacts immediately and directly against the tire.

4,919,230

SCAFFOLD PLATFORM SECTION

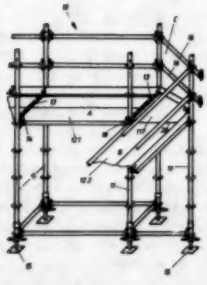
Ruth Langer, Im Weinberg 13, D-7129 Güglingen, Fed. Rep. of Germany, and Ulrich Layher, Im lailen 16, D-7129 Güglingen-Eibensbach, Fed. Rep. of Germany

Filed Sep. 23, 1988, Ser. No. 248,111

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1987, 3731945; Sep. 21, 1988, 3832066

Int. Cl.[5] E04G 1/36, 5/08

U.S. Cl. 182—179 17 Claims



1. A scaffolding arrangement for enabling a set-up of scaffolding in and around irregular shaped objects with non-parallel boundaries, the scaffolding arrangement including at least one scaffolding platform section extending in a first direction, at least one further scaffolding section extending in a second direction inclined with respect to the first direction such that a corner gap is formed between adjacent ends of the scaffolding platform sections, a corner platform means for bridging the corner gap including a floor plate means for defining a walking for working surface having drop-in means provided along at least one edge thereof for securing the floor plate means to a support means, with another edge thereof being adapted to being supported by resting on one of the scaffolding platform sections, and wherein an outer peripheral edge of the floor plate means extending between the edge provided with the drop-in means and the edge supported by resting on one of the scaffolding platform sections is one of linear, bent, or rounded in dependence upon a position of the adjoining scaffolding platform sections and support means thereof whereby the floor plate means maximally covers a corner angle defined by said corner gap.

4,919,231

DEVICE WITH A LIFELINE

Per Klokseth, 6375 Hovdenakken, Norway

Filed Sep. 13, 1988, Ser. No. 243,973

Int. Cl.[5] A62B 35/00

U.S. Cl. 182—5 7 Claims

1. A lifeline device for lowering persons from a burning building, the device comprising a housing with a line pulley means mounted therein and a lifeline, characterized by the line pulley means being made up of a freely rotatable friction-pulley having a grooved-shaped track, the lifeline having a first lowering end and a total length corresponding to the mounting height of the device from the ground, said lifeline being designed to slide through the friction pulley groove when locked, and the friction-pulley includes means which will cause the pulley to lock to prevent rotation when the weight of a person being lowered is applied to the lifeline.

4,919,232

COLD LUBRICANT MISTING DEVICE AND METHOD

Hugh Loftus, 3565 Linden Ave. #347, Long Beach, Calif. 90807

Filed May 12, 1989, Ser. No. 351,440

Int. Cl.[5] F01M 1/00

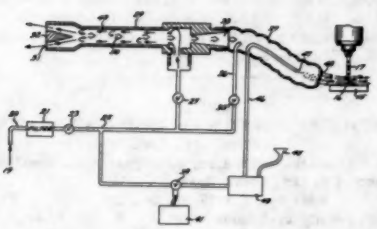
U.S. Cl. 184—6.26 8 Claims

1. In a machining operation in which a machine tool engaged a workpiece, a method for reducing heat generated thereby, comprising the steps of:

cooling an airstream substantially below ambient temperature;

introducing lubricant into said cooled airstream at a con-

trolled rate, whereby said lubricant is first atomized to form a fine mist and then cooled to a subambient temperature;

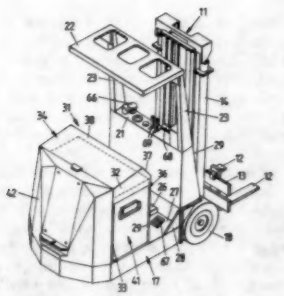


directing said cold lubricant mist toward the workpiecemachine tool interface.

4,919,233
FRONT RIDER LIFT TRUCK

Kurt K. Larsen, and Pete Santiago, both of Pell City, Ala., assignors to Blue Giant Equipment Corporation, Pell City, Ala.

Filed Jun. 3, 1988, Ser. No. 202,207
Int. Cl.[5] B66F 9/00
U.S. Cl. 187—9 R **4 Claims**



1. A lift truck comprising:

(a) a mast assembly including a set of vertically movable lifting forks;

(b) a body assembly operatively connected to support said mast assembly,

(c) a battery compartment having a front wall extending upward from a body assembly, a rear wall extending upwardly from said body assembly, and co-extensively with said front wall, a cover member having a pair of sidewalls each of which has a non-linear upper edge and extends from a top corner of said front wall to a co-extensive top corner of said rear wall, and a top member hingedly mounted to said front wall and extending upwardly then rearwardly engaging said sidewalls along the non-linear upper edge and providing a support member against which the operator may rest, said battery compartment also having open sides perpendicular to said front and rear walls providing access to the compartment;

(d) battery means extending coextensively with said compartment for providing electric power and a counter balance to said lift forks;

(e) a shield having a console and an overhead guard supported by lateral posts; said body assembly supporting said mast assembly with said battery compartment extending transversely thereof and said shield extending transversely of said body assembly proximal said mast assembly with said battery compartment and said shield spaced apart to form a rider platform therebetween with said rider platform being accessible from either side of said body assembly;

(f) a pair of spaced apart drive wheels mounted to said body assembly beneath said forward shield;

(g) a steerable rear wheel assembly mounted to said rearwall proximal the centerline thereof rearwardly of said battery compartment;

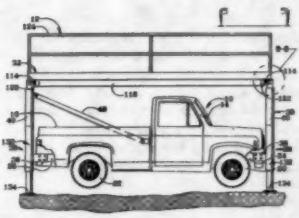
(h) a housing extending about said steerable rear wheel assembly from said body assemble to said rear wall; and,

(i) means for steering said rear wheel assembly.

4,919,234
PORTABLE LIFT

Theodore S. Pearson, deceased, late of Callender, and by Diane M. Pearson, executor, 4011 Hunter St., Callender, both of Iowa 50523

Filed Nov. 9, 1988, Ser. No. 269,579
Int. Cl.[5] B66B 9/20
U.S. Cl. 187—9 R **7 Claims**



1. A portable lift adapted to be connected to a vehicle having forward and rear ends and ground engaging wheels, said lift comprising:

a forward lift frame and a rear lift frame adapted to be connected to said forward and rear ends of said vehicle respectively;

each of said forward and rear lift frames comprising a vertical tube assembly having an upper end and a lower end and having at least two vertical tubes telescopically mounted with respect to one another for telescopic movement from a retracted position wherein said upper end of said tube assembly is at a first level to an extended position wherein said upper end of said tube assembly is located a substantial distance above said first level;

first and second hydraulic extensible power means within said tube assemblies of said forward and rear lift frames respectively for causing raising and lowering of said forward and rear lift frames between said retracted and extended positions;

an elongated support platform having a first end pivotally connected to said upper end of said tube assembly of said forward lift frame and having a second end pivotally connected to said upper end of said tube assembly of said rear lift frame;

each of said forward and rear lift frames comprising a horizontal frame member having opposite ends and being rigidly attached to said lower end of said tube assembly;

an outrigger means connected to each of said opposite ends of said horizontal frame members of said forward and rear lift frames, said outrigger means comprising a vertically movable foot and power means connected to said foot for causing vertical movement thereof to engage a supporting surface so as to permit leveling of said lift;

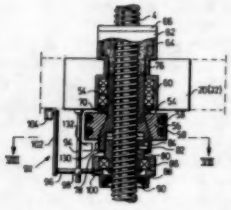
each of said horizontal frame members of said forward and rear lift frames including securing means thereon for

securing said forward and rear lift frames to said forward and rear ends respectively of said vehicle.

4,919,235
FIRE EXIT SYSTEM
Eugene DelSavio, 425 Boyd St., Akron, Ohio 44305
Filed Sep. 8, 1987, Ser. No. 93,988
Int. Cl.[5] E06C *9/10*
U.S. Cl. 182—18 **7 Claims**

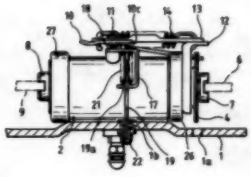
1. A building fire escape system automatically triggered by a fire, comprising a smoke detection device which upon detecting smoke, transmits a detectable signal to a windlass system that detects said signal, and in response thereto, removes a locking pin from a door latch assembly mounted on an exit door by retractably winding a cable attached to said pin on a windlass, thus permitting the exit door to be opened by a self-actuating exit door opening device selected from the group consisting of:
   a device comprising a door opening spring;
   a device comprising a door opening counterweight, and
   a device comprising a door opening pneumatic cylinder, thereby allowing emergency egress from the building through the opened exit door.

4,919,236
SCREW LIFT
Klas Karlsson, Spånga, and Rune Bergvall, Bro, both of Sweden, assignors to NTD Hiss Nartransportdon AB, Sweden
PCT No. PCT/SE86/00248, § 371 Date Jun. 12, 1987, § 102(e) Date Jun. 12, 1987, PCT Pub. No. WO86/07041, PCT Pub. Date Dec. 4, 1986
PCT Filed May 30, 1986, Ser. No. 33,089
Claims priority, application Sweden, May 31, 1985, 8502693; Mar. 20, 1986, 8601313
Int. Cl.[5] B66B *11/04*
U.S. Cl. 187—25 **18 Claims**



1. A screw lift comprising a lift car which is movably supported along an upright fixed screw, said lift car carrying a drive nut in engagement with said screw and with belt drive means including at least one electric motor for rotation of said drive nut on said screw, said lift car thereby driven along said screw, and said drive nut rotatably journalled in a lubrication and bearing housing connected with said lift car, said drive nut carrying said lift car via a belt pulley driven by said belt drive means electric motor, said belt pulley disengageable from said drive nut when said lift car impacts an exterior obstacle such that when said lift car impacts an exterior obstacle at the bottom of said lift car, said lift car is displaced vertically thereby vertically displacing said belt pulley to completely disengage said belt pulley from said drive nut.

4,919,237
AUTOMATIC ADJUSTER RELEASING APPARATUS FOR DRUM BRAKE
Kimihiro Yamazaki, Saitama, Japan, assignor to Akebono Brake Industry Co., Ltd., Tokyo, Japan
Filed Apr. 7, 1989, Ser. No. 334,507
Claims priority, application Japan, Apr. 8, 1988, 63-46776[U]
Int. Cl.[5] F16D *65/56*
U.S. Cl. 188—79.62 **5 Claims**

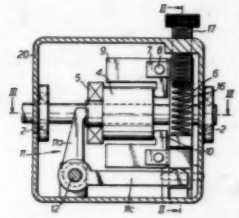


1. An automatic adjuster releasing apparatus for a drum brake having a backing plate and a wheel cylinder, comprising:
   a piston slidably received in said wheel cylinder;
   an adjuster nut having an adjuster gear, said adjuster nut being angularly movably received in said piston;
   an adjuster screw having a brake shoe supported on a front end thereof, said adjuster screw being threaded into said adjuster nut;
   adjuster lever pivotally connected at first end thereof to an outer surface of said wheel cylinder, said adjuster lever being connected intermediate opposite ends thereof to said piston, second end of said adjuster lever being resiliently engaged with said adjuster gear for allowing said adjuster gear to be rotated only in one direction;
   a support member fixedly mounted on said wheel cyliner;
   a pin member slidably supported by said support member, said pin member having a first end extending from an opening formed on said backing plate, a second end of said pin member facing and engageable with an inner surface of said adjuster lever, said second end of said pin member disengaging said second end of said adjuster lever from said adjuster gear when said second end of said pin member is urged against said inner surface of said adjuster lever;
   a resilient member for urging said first end of said pin member to be projected from said opening on said backing plate; and
   a flexible cover fitted in said opening for covering said first end of said pin member.

4,919,238
VARIABLE CENTRIFUGAL BRAKE
Hugh W. Skipper, High House, Parc-y Brian Rd., Penperlleni, Pontypool, Gwent, United Kingdom
Filed Jan. 10, 1989, Ser. No. 295,432
Claims priority, application United Kingdom, Jan. 13, 1988, 8800632; Nov. 1, 1988, 8825553
Int. Cl.[5] B60T *7/12*
U.S. Cl. 188—186 **2 Claims**

1. A variable centrifugal brake, comprising a main shaft having an axis and being connected to an external power input

which the brake is required to control, a disc means keyed to the main shaft for rotation therewith, said disc means having a circular peripheral surface, a bush fitted to the main shaft, at least one weight pivotally mounted to the disc means to transmit an axial force to the bush as the disc means rotates, the bush being free to slide on the main shaft, a first lever arm mounted on a first pivot and having a portion faced with a friction lining which is arranged to bear against the circular peripheral surface of the disc means when the first lever arm is moved in a predetermined direction about the first pivot, a second lever in



engagement with the first lever arm to move said first lever arm in said predetermined direction, said second lever being pivotally mounted on a second pivot and having a pair of forks with one fork portion at either side of the main shaft, and a thrust bearing carried on the bush to transmit the axial force from the bush to the forks to pivot the second lever and so move the second lever about the second pivot, and a spring having an adjustable anchor point and arranged to oppose movement of the lining-faced portion of the first lever arm towards the peripheral surface of the disc means.

4,919,239

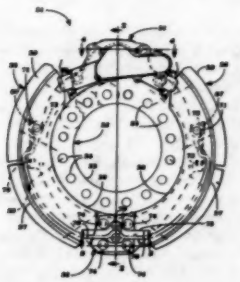
SHOE RETURN SPRING

John A. Urban, Plainwell, Mich., assignor to Lucas Industries Public Limited Company, Birmingham, England

Filed Dec. 15, 1987, Ser. No. 133,005

Int. Cl.[5] F16D *65/14, 65/10*

U.S. Cl. 188—216 **30 Claims**



1. A return spring arrangement for a drum brake having a backing plate adapted to be affixed relative to a brake drum rotatable about an axis, a pair of brake shoes supported for movement relaltive to said backing plate from a retracted position to an engaged position with the associated brake drum, a formed leaf type return spring for urging said brake shoes to their retracted position comprising a pair of end portions each operably engaged with a respective one of said brake shoes and an intermediate position adapted to be fixed relative to said backing plate against circumferential movement, and a pair of posts affixed to said backing plate and positioned to engage and retain the flat sides of said return spring intermediate portion for retaining said return spring against circumferential movement about the brake drum axis and relative to said backing plate without interfering with the flexure of said return spring.

4,919,240

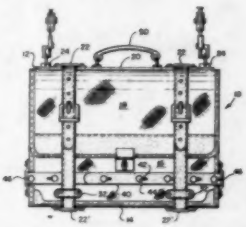
EXPANDABLE VALISE

Charles S. Tobias, Box 626, Road Town, Tortola, V.I.

Filed May 25, 1989, Ser. No. 356,722

Int. Cl.[5] A45C *7/00, 13/26, 13/30*

U.S. Cl. 190—103 **4 Claims**



1. A collapsible-expandable valise, comprising:

(a) enclosable top, front, rear, and side panels, and an extensible-contractible bottom panel, including flexible convolutions extending between said side panels;

(b) a rigid batten, centered adjustably upon said top panel, said rigid batten supporting top vertical strap keepers adjacent opposed ends of the batten, and two shoulder strap anchors at the ends of said batten;

(c) plural vertical straps, vertically encircling the valise, said vertical straps being adjustably secured to said batten bys aid top keepers affixed to said batten, and adjustably secured to said bottom panel by bottom keepers affixed to said bottom panel, and nadjustablys ecurd to said front and rear panels by front and rear strap guides affied respectively tos aid front and said rear panels;

(d) a horizontal encircling valise strap positioennd adjacent said bottom panela nd adjustablys ecured tos aid side panels by side keepers, said horizoentals trap containing adjusting apertures wherebys aid horizontal strap is adjustable in length, relative to the overall exterior circumference of the said side panels and said front and rear panels, as defined bys aid flexible convolutions; and

(e) adjusting studs protruding from at least one of said panels, so as to complementally engage and secure said encircling valise strap adjusting apertures.

4,919,241

LOCKUP DAMPER FOR TORQUE CONVERTER

Masahiko Koshimo, Higashiosaka, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

PCT No. PCT/JP88/00036, § 371 Date Sep. 9, 1988, § 102(e) Date Sep. 9, 1988, PCT Pub. No. WO88/05511, PCT Pub. Date Jul. 28, 1988

PCT Filed Jan. 19, 1988, Ser. No. 246,824

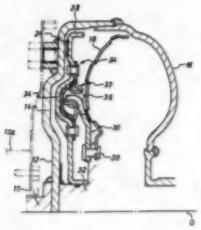
Claims priority, application Japan, Jan. 22, 1987, 62-8003[U]

Int. Cl.[5] F16H *45/02*; F16D *3/50*

U.S. Cl. 192—3.29 **7 Claims**

1. A lockup damper for a torque converter, said torque converter having a front cover with a convex portion curved toward an outside at its radially intermediate part and to which power is transmitted, a turbine and a turbine hub fixed to said turbine; said lockup damper comprising an approximately annular disc-like piston having a convex portion curved toward said front cover at its radially intermediate part adjacent said convex portion of the front cover, said piston being

mounted on said turbine hub freely slidable in an axial direction relative to said front cover; a plurality of coil springs disposed circumferentially in said convex portion of said piston; an annular retaining plate for holding said coil springs from moving radially outward secured to said piston radially outward of said convex portion of said piston; a side plate for holding said coil springs from moving radially inward secured to said piston



radially inward of said convex portion of said piston; spring seats for compressing coil springs formed on any one or both of said retaining plate and said side plate; and a power transmitting driven plate fastened at its inner peripheral part to said turbine and having axially projecting claws extending toward said convex portion of said piston between adjacent ones of said coil springs.

4,919,242

SHIFT LEVER LOCKING APPARATUS

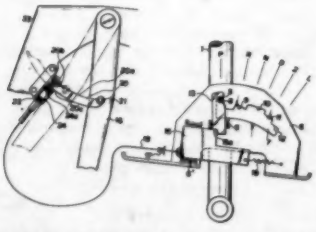
Tadao Muramatsu, Toyota, and Shinichi Yamamuro, Toyoake, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Chuo Hatsujo Kabushiki Kaisha, both of Aichi, Japan

Filed Oct. 21, 1988, Ser. No. 260,678

Claims priority, application Japan, Oct. 30, 1987, 62-166381[U]

Int. Cl.[5] B60K *41/28*

U.S. Cl. 192—4 A **8 Claims**



1. In combination with an automobile having a pivotally movable brake pedal and a shift lever adapted to be pivotally turned and set at any desired one of positions corresponding to a plurality of driving states including a parking state,

an apparatus for locking the shift lever, comprising

a detent pin associated with the shift lever so as to be moved up and down by push-button manipulation,

a ratchet plate including at least one engagement portion for engaging the detent pin to prevent pivotal turn of the shift lever when the shift lever is set at the parking state,

means for locking the detent pin, said locking means preventing the detent pin from disengaging from the engagement portion in a locking state, but allowing the detent pin to disengage from the engagement portion in an unlocking state,

a cam mounted to the brake pedal for rotation about an axis parallel to the pivotal axis of the brake pedal and having a bearing surface and a cam surface which has a varying height from the bearing surface,

a follower adapted to be moved in one direction in contact with the cam surface,

a stop disposed in consistent contact with the bearing surface of the cam for bearing the reaction of cam action, and

a wirelike member connecting said follower and said locking means,

whereby when the brake pedal is stepped down, the follower is moved in one direction through the cam to thereby change the locking means from the locking state to the unlocking state through said wirelike member.

4,919,243

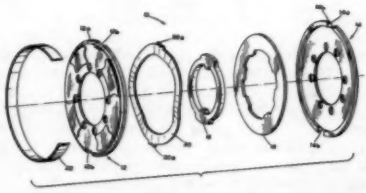
CLUTCH BRAKE HAVING SEGMENTED COVER SURFACES

Richard A. Flotow, Butler, Ind., assignor to Dana Corporation, Toledo, Ohio

Continuation of Ser. No. 28,935, Mar. 23, 1987, abandoned. This application Mar. 8, 1989, Ser. No. 320,905

Int. Cl.[5] F16D *67/02*

U.S. Cl. 192—18 R **12 Claims**



1. A clutch brake comprising:

a pair of opposed covers, each of said covers including an outer facing surface and an inner facing surface, each of said outer facing surfaces including a plurality of embossed segments separated by non-raised areas, each of said inner facing surfaces including a flat recessed portion extending throughout said inner facing surface, said covers being secured together such that said inner facing surfaces define an internal cavity;

inner and outer brake washers disposed within said cavity; and

a wave washer disposed within said cavity, said wave washer including a plurality of waves, each of which abuts one of said inner facing surfaces only opposite one of said non-raised areas of said outer facing surface.

7. A clutch brake comprising:

brake washer means adapted to be mounted on a shaft for rotation therewith;

first and second covers having respective outer circumferential surfaces and respective pluralities of embossed friction segments thereon, said friction segments adapted to be selectively engaged by a stationary member when it is desired to stop the shaft from rotating, said covers enclosing and frictionally engaging said brake washer means while being rotatable relative thereto; and

clamping band means extending over said outer circumferential surfaces to secure said covers together.

10. A method for forming a clutch brake comprising the steps of:

(a) providing a brake washer means, including means for coupling the brake washer means to a shaft for rotation therewith, for braking rotation of the shaft;

(b) providing first and second covers having respective outer circumferential surfaces and friction surfaces, the friction surfaces adapted to be selectively engaged by a stationary member when it is desired to stop the shaft from rotating;

(c) orienting the covers so as to enclose and frictionally

engage the brake washer means while being rotatable relative thereto; and

(d) crimping a clamping band means over the outer circumferential surfaces to secure the covers together.

4,919,244

OIL-BATH MECHANICAL DRIVE BOX WITH INPUT AND OUTPUT SHAFTS AND WITH AUTOMATIC AND/OR DRIVEN DEVICES HOUSED THEREIN AND INSERTED IN THE DRIVE

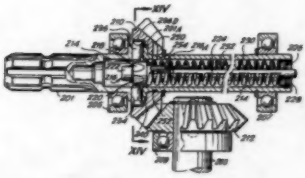
Edi Bordioli, Via Gina Bianchi, 18, 46029 Suzzara, Mantova, Italy

Filed Aug. 11, 1988, Ser. No. 231,184

Claims priority, application Italy, Aug. 13, 1987, 9458 A/87

Int. Cl.[5] F16D *43/20*

U.S. Cl. 192—56 R **13 Claims**



1. A mechanical drive box comprising at least a shaft and at least a drive member on the shaft, and a device for the transmission of motion between the shaft and the drive member, said device for the transmission of motion between said shaft and the drive member mounted thereon including: a set of pawls radially movable within seats formed in the shaft to ensure the guiding of the pawls, said pawls having inner and outer ends shaped in one of a radial and axial direction; said drive member having a shaped surface for cooperating with the outer ends of said pawls; an axial cavity defined inside said shaft for receiving an axially movable shaped core, said shaped core being connected with elastic means biasing said core into engagement with said pawls, said core having shaped inclined surfaces able to cooperate with the inner shaped ends of the pawls; the axial position of said core, and/or the force of the elastic means acting on the core and/or the pawls resistance against centripetal displacement determining the radial position of said pawls, wherein within said drive member a housing is formed, said housing defining said seats, perimetraly formed to cooperate with the shaped outer ends of the pawls, at least a second shaft with at least a gear member connected to said drive member, said drive member including a bevel gear and said housing being formed in a larger part of the body of said bevel gear, radial passages being provided between the drive member bevel teeth running as far as the axial cavity of the shaft, a manifold being provided in the cooperating surfaces of said drive member and said shaft.

4,919,245

HEAT ECONOMIZER

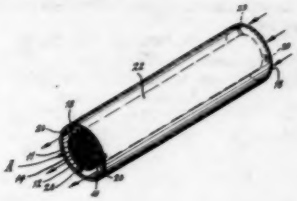
Francis A. Braden, 3627 Paule Ave., St. Louis, Mo. 63125-1715

Filed Jun. 19, 1989, Ser. No. 367,801

Int. Cl.[5] F28D *17/00*

U.S. Cl. 165—10 **5 Claims**

1. In a building heating system: a heat economizing device comprising; a perforated container having a cross-section, for filling with and retention of a material capable of storing and emitting heat, a quantity of material capable of storing and emitting heat, provided within said container and attachment means for securing the filled container within a ventilation



duct forming an elongated heat transfer space having a cross-section greater than the cross-section of said container.

4,919,246

ASSEMBLY OF TWO GENERALLY ANNULAR MEMBERS, IN PARTICULAR A DIAPHRAGM AND SECURING MEMBER FOR A CLUTCH MECHANISM, PARTICULARLY FOR AN AUTOMOBILE

Christian Gay, Paris, and Philippe Lassiaz, Boulogne, both of France, assignors to Valeo, Paris, France

Filed Jan. 11, 1989, Ser. No. 295,544

Claims priority, application France, Jan. 13, 1988, 88 00302

Int. Cl.[5] F16D *13/44*

U.S. Cl. 192—89 B **8 Claims**

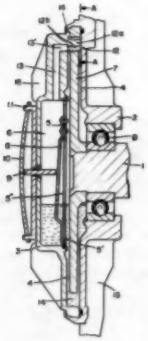
1. A clutch diaphragm assembly comprising a clutch diaphragm, said clutch diaphragm including a Belleville washer, said clutch diaphragm having a periperal portion, a central portion divided into a plurality of radial fingers alternating with openings, and a central opening, a securing member for attaching a clutch release bearing to said radial fingers of said clutch diaphragm, said securing member having a thrust portion with tabs which extend from said thrust portion, said securing member further having a sleeve portion radially offset to said tabs and extending from said thrust portion, wherein said securing member bears axially on a first side of said diaphragm in the vicinity of free ends of its radial fingers by means of said thrust portion and extending through said diaphragm by means of said tabs which are adapted to be received between adjacent pairs of radial fingers of said diaphragm, said sleeve portion received in said central opening of said diaphragm, an axially acting resilient ring of the Belleville washer type being interposed between said tabs and said diaphragm, said resilient ring being interposed at the side of said diaphragm opposite to its first side wherein said resilient ring bears through one of its peripheral zones on notches, each of which is individually formed to as to extend transversely in a respective one of the tabs of said securing member, and said resilient ring further bearing on said diaphragm through its other peripheral zone.

4,919,247

THERMOSENSITIVE FLUIDIZED FAN COUPLING DEVICE

Kazunori Takikawa, Sanmaibashi, and Yuichi Ono, Numazu, both of Japan, assignors to Usui Kokusai Sangyo Kaisha Ltd., Shizuoka, Japan

Filed Nov. 23, 1988, Ser. No. 275,766
Claims priority, application Japan, Dec. 1, 1987, 62-303656
The portion of the term of this patent subsequent to Jan. 10, 2006, has been disclaimed.
Int. Cl.[5] F16D 31/00
U.S. Cl. 192—58 B 6 Claims



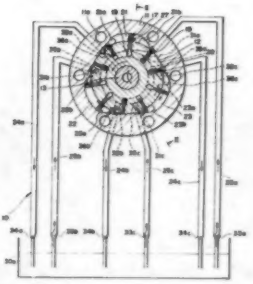
1. A thermosensitive fluidized fan coupling device, comprising: a rotatable shaft, a sealed housing rotatably mounted to said shaft, said sealed housing having an interior with an inner peripheral wall surface, a divider having an oil outflow regulating hole disposed in said sealed housing and partitioning said interior of said sealed housing into an oil reservoir and a torque transfer chamber, a driving disk provided on said shaft and disposed in the torque transfer chamber, said driving disk having an outer peripheral wall portion disposed in opposition to said inner peripheral wall surface of said sealed housing, a dam provided on a part of the inner peripheral wall surface of said sealed housing opposite to said outer peripheral wall portion of said driving disk on which an oil accumulates at the time of rotation, a circulation passage extending from a portion of said torque transfer chamber near said dam to said oil reservoir, a valve member for operating the outflow regulating hole of said divider by cooperation with a thermosensitive member provided on an exterior portion of said sealed housing according to ambient temperature change, wherein a torque transfer from said rotating shaft to said sealed housing is controlled by adjusting an effective contact area of the oil at a torque transfer gap between opposite outwardly disposed portions of said driving disk and the sealed housing, the improvement characterized in that an annular idle oil groove is formed between said outer peripheral wall portion of said driving disk and said inner peripheral wall surface on said sealed housing for a selected interval along said peripheral surfaces, said dam comprising a master dam provided in said idle oil groove in proximity to said circulation passage and spaced outwardly from said outer peripheral wall portion of said driving disk and a subsidiary dam provided projectingly from said master dam into sliding relationship with said outer peripheral wall portion of the driving disk, and further comprising an oil circulating means for allowing said oil reservoir and said torque transfer chamber to communicate with each other only at the time of stopping, said oil circulating means being provided near a central portion of said divider.

4,919,248

DRIVE COUPLING UNIT

Takeo Hiramatsu, Nagaokakyo; Kenjiro Fujita, Kusatsu; Yoshimasa Nagayoshi, Kyoto; Shuzo Hirakushi, and Yoshiaki Hamasaki, both of Osaka, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo and Koyo Seiko Kabushiki Kaisha, Osaka, both of, Japan

Filed Nov. 17, 1988, Ser. No. 272,417
Claims priority, application Japan, Dec. 8, 1987, 62-310472; Mar. 31, 1988, 63-78920
Int. Cl.[5] B60K 17/34; F01C 21/00
U.S. Cl. 192—61 2 Claims



1. A drive coupling unit comprising:

a cam ring connected to a first rotating shaft;

a rotor connected to a second rotating shaft and rotatably disposed in said cam ring so as to define therebetween a plurality of pump chambers;

a multiplicity of sliding vanes mounted on an outer peripheral surface of said rotor and slidably engaging an inner Peripheral surface of said cam ring so as to divide each of said pump chambers into a discharge side compartment having a discharge port and an intake side compartment having an intake port;

a working fluid filled in said pump chambers for being compressed in said discharge said compartment and the circulated into said intake side compartment in each of said pump chambers as said cam ring and said rotor are rotated relative to one another due to a difference in rotational speed between said first rotating shaft and said second rotating shaft;

an orifice disposed in a working fluid flow passage interconnecting said discharge side compartment and said intake side compartment in which of said pump chambers;

a tank storing therein said working fluid;

a pair of working fluid supply passages extending between said tank and each said pump chambers, said pair of working fluid supply passages including a discharge fluid supply passage connected to a corresponding one of said discharge ports and an intake fluid supply passage connected to a corresponding one of said intake ports, for selectively supplying said working fluid therethrough from said tank; and

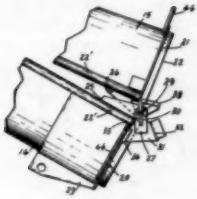
a check valve disposed in each of said working fluid supply passages, whereby each said intake/discharge port is communicated with said tank through a corresponding one of said working fluid supply passages and a corresponding one to said check valves.

4,919,249

MULTIPLE SECTION CHUTE RESTRICTOR

Dennis W. Alexander, Oak Creek, Wis., assignor to Rexworks Inc., Milwaukee, Wis.

Filed Apr. 17, 1989, Ser. No. 344,071
Int. Cl.[5] B65G *11/14*
U.S. Cl. 193—6 **7 Claims**



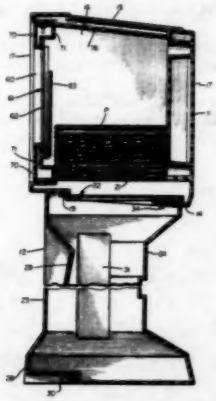
1. Apparatus for preventing hinged sections of a chute from abutting each other when the sections are aligned, comprising a set of hinges connecting the sections, a plate mounted on one of the hinges arranged when in operative position to prevent such abutment, means for moving said plate to an inoperative position enabling such abutment and cam means on said hinge arranged to restore the plate to its original position when the sections are folded out of an aligned position.

4,919,250

NEWSPAPER OR OTHER ARTICLE VENDING DEVICE

John B. Olson, Waukesha; Richard L. Jeanson, Watertown, and John D. Sinchok, Oconomowoc, all of Wis., assignors to Fortec, Inc., Waukesha, Wis.

Filed Jun. 28, 1988, Ser. No. 212,716
Int. Cl.[5] G07F *11/04*
U.S. Cl. 194—248 **36 Claims**



1. A vending apparatus for newspapers or other articles comprising:

a receptacle adapted to receive said newspaper comprising a top, bottom and spaced side walls;

an access door connected to said receptacle for gaining access to said member;

access door closure means including biasing means for closing and biasing said door to be in a normally closed position;

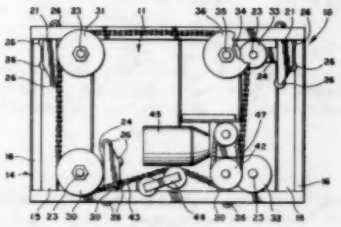
said closure means including said biasing means being substantially enclosed within said receptacle and access door whereby said closure means including said biasing means is hidden from view and free from direct exposure to the weather elements when said access door is open and when said access door is closed.

4,919,251

CONVEYOR ESCAPEMENT

Leon A. Downing, 3011 Oak Hill Road, Peninsula, Ohio 44264

Filed Dec. 5, 1988, Ser. No. 279,828
Int. Cl.[5] B65G *37/00*
U.S. Cl. 198—463.6 **6 Claims**



1. Apparatus for controlling the travel of articles along a conveyor track, comprising frame means positioned relative to the conveyor track, and having a downstream end and an upstream end; a first pair of gate means extending from said downstream end of said frame means into the travel path of the articles, said first pair of gate means being rotatable synchronously between a closed position and an open position; a second pair of gate means extending from said upstream end of said frame means into the travel path of the article, said second pair of gate means being rotatable synchronously between an open position and a closed position; said gate means including swing plate means rotatable about an axis substantially normal to the travel path of the articles and support plate means secured to the radiasly distal end of said swing plate means and movable in a plane substantially parallel to the travel path of the articles; rollers depending from said support plate means substantially lateral to the travel path of the articles and movable by said swing plate means selectively into the travel path of the asrticles, said rollers being positioned on said support plate means substantially accurately about said axis of rotation of said swing plate means; and drive means simultaneously to rotate said first pair and said second pair of gate means so that when one of said pairs of gate means is in the closed position the other of said pair of gate means is in an open position.

4,919,252

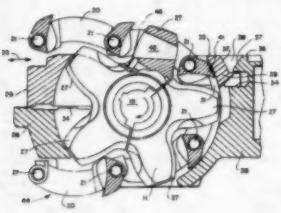
CHAIN CONVEYOR FOR MINER

Edward Wechner, Minnamurra, Australia, assignor to Joy Technologies Inc., Pittsburgh, Pa.

Filed Mar. 3, 1988, Ser. No. 162,836
Claims priority, application Australia, Mar. 5, 1987, PI0701
Int. Cl.[5] B65G *45/00*
U.S. Cl. 198—494 **5 Claims**

1. An improved chain conveyor of the type having a drive sprocket at one end of the conveyor, a parallel idler sprocket at the opposite end of the conveyor, and one or more links of chain engaged over the sprockets providing a moving surface for the conveying of particulate material, wherein the improvement comprises an entry casting adjacent the drive sprocket, and wherein the drive sprocket has no more than five teeth and the chain links are accordingly sized with cavities therethrough to fit over the sprocket teeth, the entry casting having channels therethrough shaped and located to guide and support the chain links passing over the drive sprocket such that tension in the chains is reacted by the entry casting, and wherein each tooth of the drive sprocket has an aperture there-

through in the direction of rotation of that tooth, the aperture being tapered from a relatively narrow cross section at the



leading face of the tooth to a relatively wide cross section at the trailing face of the tooth to avoid a build-up of fine particulate material between the chain links and the sprocket teeth.

4,919,253

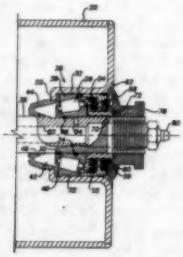
BEARING LUBRICATION SYSTEM

Thomas E. Morrison, Guin, Ala., assignor to Continental Conveyor & Equipment Company, Inc., Winfield, Ala.

Filed Jun. 6, 1988, Ser. No. 202,454

Int. Cl.[5] B65G *39/00*

U.S. Cl. 198—501 **14 Claims**



1. In an idler roll assembly for belt conveyors and the like having at least one roll mounted for rotation on a tubular shaft having an inner bore and an outer cylindrical surface by bearings, with an inner cylindrical surface of an inner race of said bearings being mounted on the outer cylindrical surface of said shaft, said tubular shaft having radially extending passages to provide a lubricant path from the inner bore of said shaft to said bearings, in combination therewith the improvement wherein said lubricant path is defined in part by said radially extending passage and is defined in part by an axially extending passage having a cross section in the shape of a circular segment which is in turn defined by a cylindrical portion of the inner surface of said bearing race and a planar portion of the surface of said shaft.

4,919,254

WALKING BEAM APPARATUS AND METHOD

Francis H. Bricmont, Pittsburgh, Pa., assignor to Bricmont & Associates, Inc., McMurray, Pa.

Filed Feb. 1, 1988, Ser. No. 151,027

Int. Cl.[5] B65G *25/00*

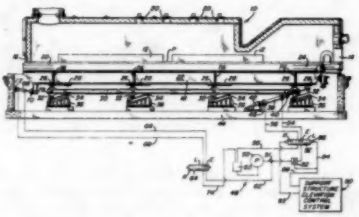
U.S. Cl. 198—751 **24 Claims**

1. In a walking beam apparatus which is adapted to transport articles in incremental steps through a given rectilinear path of travel, the combination comprising:

a pair of article supporting structures for alternately supporting such articles, at least one of said structures being a walking beam assembly;

drive means operatively associated with said structures to provide motive power for selectively moving each of said structures in vertical directions below a selected common vertical elevation whereat upwardly facing support portions of said structures reside substantially in a given plane;

means operable for limiting vertically upward movement of said structures to preclude movement thereof above said common vertical elevation, said means for limiting verti-



cally upward movement of said structures includes means operable to detect attainment of said selected common vertical elevation by said structures, respectively, during vertically upward movement thereof; and

control means operable upon detecting a change in force relative to said drive means upon said attainment of said common vertical elevation by either one of said supporting structures to lower the other of said supporting structures from said common vertical elevation whereby such articles are continuously supported substantially on said given plane throughout operation of said walking beam apparatus.

4,919,255

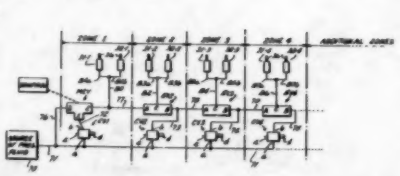
ZERO PRESSURE ACCUMULATING CONVEYOR AND MODULE

Steven J. Morgan, Jeffersonville, Ind., and Gary L. Martin, Louisville, Ky., assignors to Figgie International Inc., Westlake, Ohio

Continuation of Ser. No. 623,371, Jun. 22, 1984, Pat. No. 4,609,098, which is a continuation of Ser. No. 356,213, Mar. 8, 1982, abandoned. This application Mar. 14, 1986, Ser. No. 839,543

Int. Cl.[5] B65G *13/06*

U.S. Cl. 198—781 **2 Claims**



1. In a belt driven live roller zero pressure accumulating conveyor having a plurality of load carrying rollers defining a downstream discharge zone and upstream accumulation zones, means in each zone to selectively engage with and disengage from said rollers a drive belt to drive said zones, said means including:

groups of belt supporting tensioning rollers independently reciprocably mounted under said belt,

fluid actuator means operatively mounted with each group of tensioning rollers for raising a group of said tensioning rollers upwardly in each zone to raise the belt into engagement with the load carrying rollers of that zone, and for

dropping said group of tensioning rollers to disengage said drive belt from said load carrying rollers in that zone,

a source of pressurized fluid,

a control valve in each zone,

a shuttle valve in each upstream accumulation zone, and the total number of shuttle valves in said conveyor being equal to the number of upstream accumulation zones exclusive of said discharge zone,

means connecting each control valve to said source of pressurized fluid,

said control valves each operated by a load sensor in the respective zone and having a fluid input connected to said source of pressurized fluid,

an output of each shuttle valve connected to actuator means for its respective zone,

said actuator means in each one upstream zone being operable to raise said tensioning rollers and to effect driving of the respective upstream zone when either the control valve of the upstream zone or that of the next downstream zone is positioned to transmit pressurized fluid to the actuator means through the shuttle valve in said upstream zone,

a single selectively operable master valve having a first inlet port connected directly to the source of pressurized fluid, a second port connected directly to the control valve of said discharge zone, and a third port connected directly to the actuator means of said discharge zone and to a shuttle valve in an adjacent zone upstream of said discharge zone,

said control valves in said upstream accumulation zones having a fluid output connected directly to both a shuttle valve in its respective zone and directly to a shuttle valve in any next upstream zone, and said control valve in said discharge zone having a fluid output selectively connectible to the shuttle valve in the next upstream zone, through said master valve,

said master valve being selectively operable in one position to pass pressurized fluid or to vent fluid between the second and third ports and the discharge zone's control valve and actuator means, and in another position to pass pressurized fluid directly from said source through the first port and the third port to the actuator means in said discharge zone, and simultaneously and directly to the shuttle valve in the next upstream zone, for simultaneously actuating the actuator means in each of the discharge and next upstream zone.

4,919,256

LOADING ROLLER CONVEYOR WITH DRIVE VIA INTERMEDIATE ROLLERS

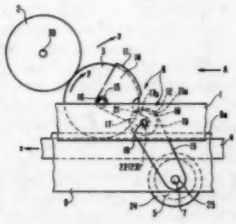
Elfriede Gebhardt, Sinsheim, Fed. Rep. of Germany, assignor to Gebhardt Fordertechnik GmbH, Sinsheim, Fed. Rep. of Germany

Filed Dec. 12, 1988, Ser. No. 282,509

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1988, 3802819

Int. Cl.[5] B65G *13/06*

U.S. Cl. 198—781 **10 Claims**



1. A loading roller conveyor with drive via intermediate rollers for conveying and transporting piece goods, comprising an actuator (1), and intermediate rollers (3) which drive support rollers (2) mounted at right angles to the direction of transportation,wherein an actuation means (4), is displaced between guide rollers (5) and intermediate rollers (3), whereby the intermediate rollers (3), which are rotated by the actuation means (4), are each mounted on an upper part of a two-part lever joint (6), a lower part of each lever joint being swivel-mounted, by means of a shaft (7) shared by the guide roller (5), on two rails (9) running parallel to a frame (8), while hinged shafts (10) connecting the upper and lower parts of each lever joint also rotatably mounted on the actuator (1) whereby the actuator by virtue of it's pivotal connection to the hinged shafts will shift the lever joints so as to cause positive engagement or disengagement of the intermediate rollers with the support rollers.

4,919,257

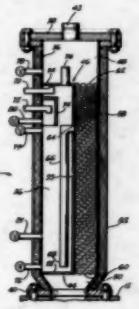
CONDENSATE SKIMMING REFLUX COLUMN

Leslie E. Brigham, Sr., and Leslie E. Brigham, Jr., both of 2000 Rosedale Dr., Edmond, Okla. 73013

Continuation-in-part of Ser. No. 177,108, Apr. 4, 1988, abandoned. This application Jul. 12, 1989, Ser. No. 378,723

Int. Cl.[5] B01D *3/32*

U.S. Cl. 202—158 **1 Claim**



1. In an apparatus for separating natural gas condensate from glycol in a gas dehydration system having a glycol reconcentration unit, the improvement comprising:

an upright elongated reflux still column open at its top end to the atmosphere and mounted on and in communication at its bottom end with the reconcentration unit;

partition means including upper and lower horizontal partitions and a diametric partition extending longitudinally of the column between said partitions for longitudinally and transversely dividing said column intermediate its ends to form upper and lower compartments at its respective end portions and a pair of juxtaposed compartments intermediate its ends,

co-operating portions of said horizontal partitions being foraminated and forming respective end limits of refluent media containing chamber,

said juxtaposed compartments forming a fluid separation reservoir and said chamber communicating at its respective ends with the upper and lower compartments;

a glycol and natural gas condensate mixture inlet port in the wall of said column adjacent the upper limit of the reservoir; a natural gas condensate outlet port spaced below said inlet port;

a gas vent port at the reservoir upper limit communicating with the column upper compartment;

liquid level control means in the reservoir communicating with a liquid level outlet port in the partition means forming the juxtaposed compartments spaced below the natu-

ral gas condensate outlet port and communicating with the refluent media containing chamber for draining glycol from the bottom end portion of the reservoir, said level control means including an elongated conductor having one end axially connected with the liquid level output port and its other end disposed adjacent the lower limit of the reservoir; and

baffle means for preventing a direct fluid communication between the natural gas condensate outlet port and the glycol and natural gas condensate mixture inlet port.

4,919,258

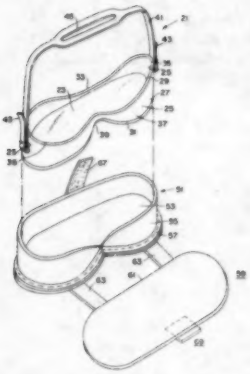
PROTECTIVE CASE FOR A DIVER'S FACE MASK

Christine R. Perretta, 3250 NE 5th Dr., Boca Raton, Fla. 33431

Filed May 30, 1989, Ser. No. 358,082

Int. Cl.[5] A45C *11/04*; B65D *81/02, 85/30*

U.S. Cl. 206—5 **10 Claims**



1. A protective case for a diver's face mask, said face mask comprising a glass window; a pliable, flexible frame supporting said window around the periphery thereof; and a headband having the ends thereof attached to opposite sides of said frame, said protective case comprising:

(a) a flat base panel of foam material;

(b) a flexible peripheral wall attached to and upstanding from a major surface and having a contour with said panel adapted to house said face mask therein without play therebetween;

(c) a flat cover panel of foam material attached on one side thereof to said wall with a pair of spaced tethers; and

(d) means for detachably attaching the other side of said cover panel to said wall.

4,919,259

PORTABLE DISPLAY CASE

Bryan Beaulieu, Burnsville, Minn., assignor to Skyline Displays, Inc., Burnsville, Minn.

Filed Apr. 3, 1989, Ser. No. 335,806

Int. Cl.[5] B65D *5/52*

U.S. Cl. 206—45.2 **4 Claims**

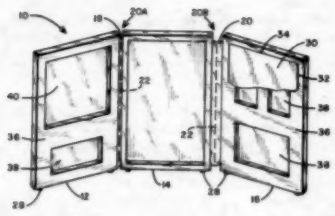
1. A portable multisectional display case for displaying and transporting information, said case comprising:

a center section having a planar front surface and a first lateral sidewall and a second lateral sidewall;

at least two adjacent sections having planar front surfaces and lateral sidewalls;

a first hinge means connecting said first lateral sidewall of said center section to a lateral sidewall of one of said adjacent sections and a second hinge means connecting said second lateral sidewall of said center section to a lateral sidewall of another adjacent section;

both of said hinge means being formed from a web material having a center line of weakness formed by a series of spaced-apart perforations, and having a parallel line of weakness equally spaced on either side of said center line of weakness, the distance between said parallel lines of



weakness being substantially equal to the thickness of said center section lateral sidewall;

said adjacent sections being foldable about said hinge means from a carrying position wherein said two adjacent sections are folded to overlie said center section, and being unfoldable about said hinge means to form a display position wherein said two adjacent sections form a display surface in combination with said center section.

4,919,260

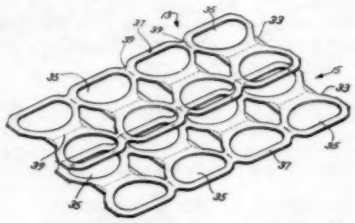
PACKAGE UNIT OF CAN-TYPE CONTAINERS

Ernest R. Cunningham, Libertyville, Ill., assignor to Grip-Pak, Inc., Deerfield, Ill.

Filed Feb. 10, 1988, Ser. No. 309,328

Int. Cl.[5] B65D *71/02*

U.S. Cl. 206—150 **5 Claims**



5. A package unit comprising: a plurality of cylindrical containers arranged in an array of rows and ranks, each of said containers having a top portion with a perimeter lip of a predetermined diameter; a first discrete packaging device formed of a resilient strip of plastic material of uniform thickness, said strip comprising a plurality of container encircling bands arranged in a connected series of rows and ranks, each of said encircling bands elastically receiving the top portion below the perimeter lip of a respective one of a first group of a plurality of said containers for connecting together adjacent rows of containers; and a second discrete packaging device formed of a resilient strip of plastic material of uniform thickness, said strip comprised of a plurality of container encircling bands arranged in a connected series of rows and ranks, each of said encircling bands of one row of said second discrete packaging device elastically receiving the top portion of a respective one of containers of one row of said first group of containers and each of the other of said encircling bands of another row of said second group elastically receiving the top portion below

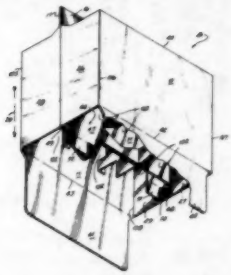
the perimeter lip of a respective one of a second group of said containers.

4,919,261

BOTTOM LOADING BASKET CARRIER

Jeffrey A. Lashyro, Crosby, Minn., and Norbert Hoell, Southgate, Ky., assignors to Minnesota Automation Inc., Crosby, Minn.

Filed May 23, 1989, Ser. No. 354,339
Int. Cl.[5] B65D *85/72*
U.S. Cl. 206—185 6 Claims



1. A basket carrier comprising

opposed side walls and opposed end walls,

a center wall disposed between said side walls to provide at least two cells for said carrier,

a floor having a first panel foldably connected to one side wall and a second panel foldably connected to the other side wall, said first floor panel being of a width approximately equal to the distance between said center wall and that side wall to which said first floor panel is foldably connected, and said second floor panel being of a width greater than the distance between said center wall and that side wall to which said second floor panel is attached, said first and second panels thereby being sized to overlap one another adjacent the bottom edge of said center wall, said first and second panels being glued to one another where saihe overlap, and

at least one connector tab foldably connected to said center wall, said connector tab being positioned between said first and second floor panels when said floor panels are glued one to the other, each glue tab therefor being glued on a first surface to said first floor panel and being glued on a second surface to said second floor panel, said center wall thereby being securely connected to said floor which enhances the vertical support for bottles positioned within said cells and also which aids in maintenance of squared corners for said carrier during use.

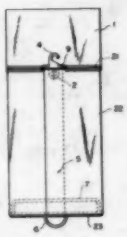
4,919,262

PORTABLE CLOTHES COVER

Yoshitada Kuroishi, Tokyo, Japan, assignor to Unix Corp., Tokyo, Japan

Filed Jan. 13, 1989, Ser. No. 297,008
Claims priority, application Japan, Jan. 19, 1988, 63-4879[U]
Int. Cl.[5] A45C *11/00*; B65D *33/14, 33/24, 85/18*
U.S. Cl. 206—287.1 7 Claims

1. In a portable clothes cover having an upper bar formed with a suspension member on which a hanger or the like can be suspended, a cover section extending downwardly from said upper bar, a lower bar transversely disposed at the lower end of said cover section, and engagable locking means associated with said upper and lower bars for releasably locking said bars together when said cover section is folded such that the said bars are in juxtaposition to each other, the improvement comprising a sheath-like bag extending from said upper bar, wherein said bag is so configured that when said bars are locked together, the bag is disposable over substantially the



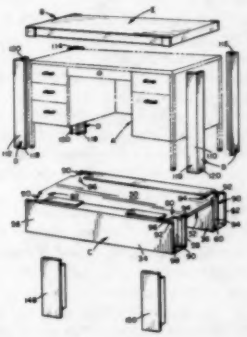
entire folded cover section by pulling the bag over the folded cover section while turning the bag inside out, whereby clothes being carried in said portable clothes cover remain in a substantially flat configuration.

4,919,263

CONTAINER PACKAGING

Donald L. Baltzer; Jack D. Kindelberger, both of Navarre, and William Bartko, Canton, all of Ohio, assignors to Vail Industries, Inc., Navarre, Ohio

Filed Oct. 17, 1988, Ser. No. 258,800
Int. Cl.[5] B65D *85/00*
U.S. Cl. 206—326 16 Claims



1. A packaging assembly adapted to protect an associated piece of furniture comprising:

a base member having

(a) an elongated, generally planar deck,

(b) a deck support member defined by a single sheet having predetermined fold lines forming first and second leg portions and a central platform disposed between said leg portions and supporting said deck;

four block members adapted to cushion legs of an associated piece of furniture received in said leg portions;

an extension member received on one end of said base member, said extension member having a predetermined conformation adapted for mating engagement with said block members;

first, second, third, and fourth corners of said base having a first end disposed at respective corners of said base member and operatively engaging one of said leg portions and extending generally perpendicularly outward from said deck; and,

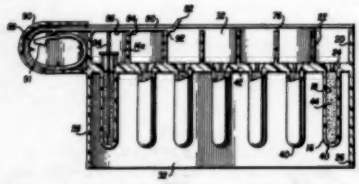
a cover member operatively engaging second ends of said corner posts and being spaced from said deck to define a cavity therebetween adapted to receive an associated piece of furniture therein.

4,919,264

MEDICAL NEEDLE REMOVING AND DISPOSING SYSTEM

Kimberly A. Shinall, 4101 Doubles Ct., Apt. 101, Virginia Beach, Va. 23462

Filed Aug. 4, 1988, Ser. No. 228,086
Int. Cl.[5] B65D *85/24, 81/18*
U.S. Cl. 206—210 **8 Claims**



1. A medical needle removing and disposing system for removing from injection and/or blood drawing equipment and disposing thereof a medical needle assembly having an elongated rigid shaft affixed on a mounting tube, said removing and disposing system comprising:

a first container defining a first chamber, said first container having a first-chamber opening at one end thereof but being otherwise closed, said first chamber being of a size for receiving said shaft of said medical needle assembly extending therein through said first-chamber opening;

a needle assembly remover means mounted at said first-chamber opening for gripping an outer surface of said mounting tube and thereby preventing said mounting tube from moving and for holding said needle assembly therein to dispose of said needle assembly;

second container defining a second chamber aligned with, and communicating with said first chamber at said first-chamber opening, said second chamber having a second chamber opening opposite said first chamber opening of a size sufficiently large for receiving said mounting tube of said medical needle assembly as well as said injection and/or blood drawing equipment on which said mounting tube is mounted when said injection and/or blood drawing equipment is manipulated to extend said shaft through said second chamber into said first container;

a one-way slidable cover having a racket mechanism thereon to allow said cover to close said second chamber opening, but to prevent said cover from being moved back to a position for uncovering said chamber opening;

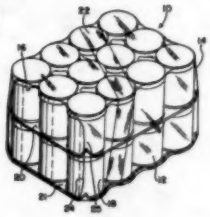
whereby, said injection and/or blood drawing equipment with a medical needle assembly mounted thereon can be manipulated to extend said shaft through said first-chamber opening into said first chamber until said mounting tube of said medical needle assembly is located at said needle assembly remover which engages said outer surface of said mounting tube, said injection and/or blood drawing equipment can then be manipulated relative to said needle assembly remover for detaching said mounting tube from said injection and/or blood drawing equipment to leave said medical needle assembly in said medical needle removing and disposing system, and said one-way slidable cover can then be closed.

4,919,265

FILM ENCASED PACKAGE

Peter Lems, 1111 Chestnut Ave., Wilmette, Ill. 60091, and Edward J. Slomski, 6106 Haligus, Woodstock, Ill. 60098

Division of Ser. No. 204,032, Jun. 8, 1988, Pat. No. 4,841,711.
This application Apr. 12, 1989, Ser. No. 321,053
Int. Cl.[5] B65D *75/00*
U.S. Cl. 206—432 **6 Claims**



1. A combination package for a plurality of containers including;

an array of containers arranged into a plurality of sub-packages, each sub-package including a plurality of containers integrated in rank and row configuration by an integral, thermoplastic carrier device having a plurality of bands gripping and retaining each container in the sub-package;

groups of sub-packages arranged on top of other groups of sub-packages so the containers in the top groups are aligned with the containers in the lower groups;

a planar sheet of thin, flexible material positioned between the containers of the top groups and containers of the lower groups;

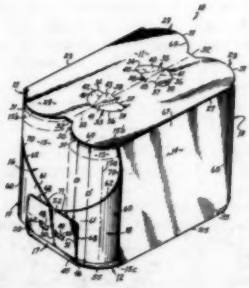
a web of stretch film wound about the groups of subpackages and sheet of flexible material, thereby creating a tightly bound, stable, integrated combination package.

4,919,266

CARTON WITH END WALL DISPLAY WINDOW

Everett L. McIntosh, Jr., Hamilton, and Charles A. Miller, Williamsburg, both of Ohio, assignors to The C. W. Zumbiel Co., Cincinnati, Ohio

Filed Jun. 9, 1989, Ser. No. 362,675
Int. Cl.[5] B65D *75/00*
U.S. Cl. 206—434 **12 Claims**



1. A container carton comprising

a bottom wall, two side walls connected to said bottom wall, a top wall connected to both said side walls, said top, bottom and side walls defining a wrap around type carton, and said bottom wall having a width sufficient to support

at least two containers being between said side walls at each end of said bottom wall,

two wrap panels at one end of said carton, one of said wrap panels being connected to one of said side walls, and the other of said wrap panels being connected to the other of said side walls, each of said wrap panels being wrapped round a portion of the outer surface of a separate end container,

an end wall connected to said bottom wall, both of said wrap panels being connected to said end wall, said end wall being of a width greater than about one-fourth the width of said bottom wall but less than about three-fourths the width of said bottom wall,

locator structure partially carried by each wrap panel and partially carried by said end wall, said locator structure functioning to locate both said wrap panels and said end wall in final operational relation relative to said side walls and said bottom wall, said locator structure comprising at least one locator hole defined in one of each wrap panel and in said end wall, and at least one locator tab defined in the other of each wrap panel and in said end wall, said locator holes and tabs being interfitted one within the other,

said wrap panels being configured to define a window so that at least a portion of those end containers about which they are wrapped are exposed to the sight of a casual viewer, the top edge of said window being defined by said top wall, and the side and bottom edges of said window being defined by said wrap panels, the side and bottom edges of said window being defined by a generally concave curvilinear edge which constitutes the top edge of each wrap panel, same cooperating to establish a window of generally shield-like configuration.

4,919,267

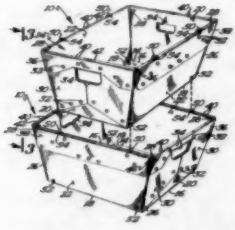
NESTABLE AND STACKABLE TOTE CONTAINERS

Mark S. Stoll, Deephaven, Minn., assignor to Liberty Diversified Industries, Minneapolis, Minn.

Filed Jul. 15, 1988, Ser. No. 219,258

Int. Cl.[5] B65D *21/04*

U.S. Cl. 206—507 **13 Claims**



1. A tote container which may be selectively nested or stacked in a vertical column with a like tote container, said tote container comprising:

a base panel having a first pair and a second pair of opposing edges and a length and a width, said length being greater than said width;

a pair of end wall panels, each said end wall panel extending generally upwardly from and being connected to one of said first pair of opposing edges of said base panel;

a pair of side wall panels, each said side wall panel extending generally upwardly from and being connected to one of said second pair of opposing edges of said base panel, each said side wall panel generally adjoining at least one of said end wall panels and being oriented generally perpendicular thereto such that said base panel, said side wall panels, and said end wall panels define a receptacle region having an open top and a bottom and a plurality of generally upright corners, said side wall panels and said end wall panels being generally outwardly tapered from said bottom of said receptacle region to said open top of said receptacle region such that the tote container may be nested within the like tote container and alternately the like tote container may be nested within the tote container; and

a retaining rim member, said retaining rim member being connected to said end wall panels and said side wall panels and extending in a generally continuous path peripherally around the open top of the receptacle region, said retaining rim member defining a plurality of segments, said segments being exposed and extending upwardly and being oriented in a first direction, with at least one of said base panel or said side wall panels or said end wall panels of the tote container defining a plurality of stacking apertures extending at least partially therethrough and positioned proximate to the bottom of the receptacle region and oriented in a second direction generally perpendicular to said first direction in which said segments are oriented,

whereby the tote container may be selectively nested within the like tote container with the generally upright corners of the tote container aligned with the generally upright corners of the like tote container, and whereby the tote container may be lifted from the nested position and rotated approximately 90° such that the length of the base panel of the tote container is generally perpendicular to the length of the base panel of the like tote container, the tote container thereby being selectively stacked in a stacked position on the like tote container and disposed over the receptacle region of the like tote container with the segments of the retaining rim member of the like tote container which are exposed removably received and engaged within the stacking apertures of the tote container, such that the base panel of the tote container partially obstructs the open top of the like tote container and the receptacle region of the like tote container may be accessed without removing the tote container from the stacked position.

4,919,268

CONTAINERS

Michael E. Young, Cardiff; David M. Edwards, South Glamorgan, and Robin Lyons, Cardiff, all of Great Britain, assignors to Creative Design and Packaging Cardiff Limited, United Kingdom

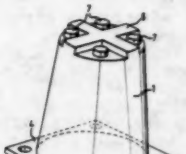
PCT No. PCT/GB86/00330, § 371 Date Apr. 6, 1987, § 102(e) Date Apr. 6, 1987, PCT Pub. No. WO86/07335, PCT Pub. Date Dec. 18, 1986

PCT Filed Jun. 9, 1986, Ser. No. 10,887

Claims priority, application United Kingdom, Jun. 8, 1985, 8514554

Int. Cl.[5] B65D *81/36*

U.S. Cl. 206—509 **1 Claim**



1. A container, comprising opposite ends, one end of the container having a laterally extending flange plate suitable for attachment of a foil closure, a portion of the flange plate within its periphery and an opposite end of the container incorporating mutually interengageable connection parts enabling two or

more similar containers to be interconnected with one another in a desired spatial relationship, wherein

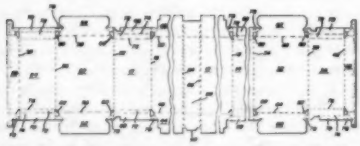
the connection parts of said opposite end comprises a cruciform shape with a projecting plug between each adjacent pair of arms of said cruciform shape.

4,919,269

MULTIPLE COMPARTMENT CONTAINER

James W. Wright, Woodstock, and John M. Holley, Jr., Norcross, both of Ga., assignors to The Mead Corporation, Dayton, Ohio

Filed Nov. 18, 1988, Ser. No. 273,389
Int. Cl.[5] B65D *5/48, 5/54*
U.S. Cl. 206—602 **6 Claims**



1. A multiple-compartment, separable container comprising:

a common top wall;

an outer side wall connected along a fold line to each opposing side edge of said top wall;

a bottom wall connected along a fold line to each outer side wall at an edge thereof opposite said top wall;

an inner side wall connected along a fold line to each bottom wall at an edge thereof opposite said outer side wall;

a lap panel having a free edge and connected opposite said free edge along a fold line to each inner side wall at an edge thereof opposite said bottom wall;

each of said lap panels being secured in underlying fashion to said top wall so that said inner side walls are disposed in face-to-face relationship;

minor end panels connected along fold lines to each end of each of said inner side walls and said outer side walls;

a major lower end panel connected along a fold line to each end of each of said bottom walls;

a major upper end panel connected along a fold line to each of said top wall;

a tear strip defined in said top panel by a pair of parallel perforated tear lines extending across said top panel parallel to the planes of said side panels;

each of said tear lines overlying one of said secured lap panels between the free edge of said lap panel and the connection between said lap panel and the adjoining one of said inner side walls; and

a web structure interconnecting along fold lines each minor end panel with adjacent ones of said lower major end panels and said lap panels, each of said tear lines overlying one of said secured lap panels between said free edge of said lap panel and the connections between said lap panel and said web structures.

4,919,270

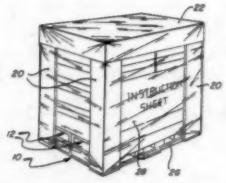
PALLET ASSEMBLY FOR PROMOTIONAL DISPLAY USE AND METHOD OF MAKING SAME

James A. Govang, Killingworth, and Mark E. Goldstein, Farmington, both of Conn., assignors to The Stanley Works, New Britain, Conn.

Continuation of Ser. No. 21,986, Mar. 5, 1987. This application May 24, 1989, Ser. No. 356,425
Int. Cl.[5] B65D *19/00*
U.S. Cl. 206—597 **8 Claims**

1. An integrated assembly of package modules, comprising a rectangular skid having an upper, normally horizontal support surface; a plurality of rectangular pallets arranged in side-by-side relationship upon said support surface; a multiplicity of package modules arranged as a plurality of stacks upon said pallets, each of said stacks comprising a multiplicity of vertically disposed package modules disposed upon a pallet, horizontally adjacent package modules being elements of different stacks, each of said stacks including first synthetic resin film means extending vertically along all four sides of each of the modules and the associated pallet and engaged with all four sides of the modules of a stack and with all four sides of its associated pallet to separately secure each of said stacks of modules to be associated one of said pallets to provide a plurality of independent subassemblies separately removable from said skid with said first film means thereof substantially intact; vertically extending, relatively rigid corner protectors on the four corners of the assembly of said subassemblies on said skid extending along the corners of said pallets and skid and along the outer surface of said first film means; horizontally extending corner protectors extending about the upper periphery of said assembly; and second resin film means for extending about and engaged with and securing all of said subassemblies to said skid to provide said integrated assembly, said second film means also covering said corner protectors, said second means and corner protectors being disengageable from said subassemblies without injury to said first film means, so as to maintain said subassemblies intact and to permit their individual removal from substantially within the periphery of said skid support surface, said pallets having support surfaces which are dimensioned and configured to cumulatively occupy substantially the same area as said skid support surface.

5. A method for the assembly and bulk transport of a multiplicity of package modules, comprising the steps:



(a) stacking vertically a plurality of package modules upon each of a plurality of pallets and within the lateral bounds of the support surfaces thereof, as defined by the periphery of the pallet to produce a series of stacks; horizontally adjacent package modules being elements of different stacks;

(b) separately applying first securing means to each of said stacks to extend vertically along all four sides thereof and to secure said modules to all four sides of the associated pallet and to thereby provide a plurality of independent subassemblies;

(c) disposing said subassemblies upon the support surface of a skid within the periphery thereof, said subassemblies cumulatively substantially occupying the support surface of said skid and lying within the periphery thereof; and

(d) placing vertically extending, relatively rigid corner protectors on the four corners of the assembled subassemblies on said skid with said corner protectors extending along the corners of said pallets and skid, and horizontally extending corner protectors along the upper periphery of said assembled subassemblies;

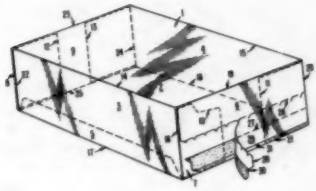
(e) applying second securing means over said subassemblies, said corner protectors and skid to engage all of said subassemblies and to secure all of said subassemblies to said skid and to thereby provide said integrated assembly, said second securing means being disengageable from said subassemblies and corner protectors without injury to said first means, said subassemblies being removable from said skid while leaving said first securing means substantially intact.

4,919,271

CARTON WITH TEAR STRIP

Morris W. Kuchenbecker, Neenah, Wis., assignor to James River Corporation, Richmond, Va.

Filed Nov. 14, 1988, Ser. No. 270,935
Int. Cl.[5] B65D 5/54
U.S. Cl. 206—611 17 Claims



1. A carton having a tear strip opening comprising:

a plurality of wall panels with at least one of said wall panels including an inner layer and an outer layer each being hingedly connected to a respective wall panel by way of a fold line;

a cut score line of weakness formed in an inner side of said outer layer cut a predetermined depth into said outer layer extending substantially the entire length of said outer layer and substantially parallel to said fold line and spaced inwardly towards said fold line from a free edge of said outer layer;

a second line of weakness formed in said outer layer extending substantially the entire length of said outer layer and substantially parallel to said fold line and spaced inwardly from said cut score line of weakness, said cut score line of weakness and said second line of weakness defining a tear strip; and

an adhesive region formed on said inner side of said outer layer defined by said free edge and said cut score line;

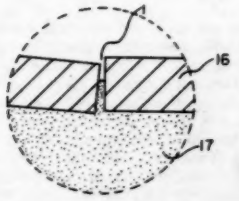
wherein said second line of weakness ruptures and a ply separation occurs in said outer layer between said cut score line of weakness and said free edge in response to an opening force being applied to said tear strip.

4,919,272

EASILY OPENABLE TIGHTLY SEALED BAG

Hisao Kai, Chiba, and Kiyoshi Nakashima, Ageo, both of Japan, assignors to Asahi Chemical Polyflex, Osaka, Japan

Continuation of Ser. No. 803,446, Dec. 2, 1985, abandoned. This application Oct. 12, 1988, Ser. No. 256,220
Claims priority, application Japan, Dec. 3, 1984, 59-254207; Dec. 14, 1984, 59-262951; Aug. 20, 1985, 60-180930
Int. Cl.[5] B65D 5/59
U.S. Cl. 206—620 9 Claims



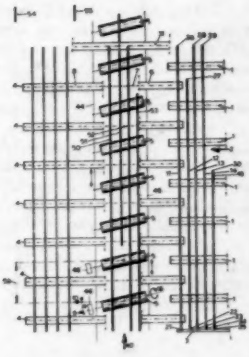
1. An easily tearing openable tightly sealed plastic bag formed of a film containing at least a substrate layer and a heat seal layer, said bag having a sealed part which is comprised of at least two substrate layers held fast to an adjacent heat seal layer, so that the heat seal layer is disposed between the substrate layers forming a sealed edge line proximate to a border end of the substrate layers, which bag is characterized by said sealed part containing in the substrate layers thereof a multiplicity of through cuts, substantially formed over a major portion of the sealed edge line and disposed at angles in the range of 70° to 110° relative to the sealed edge line, at least a significant amount of said through cuts being wholly or partially filled by the heat seal layer in such a manner that the heat seal layer penetrates into the through cuts and closes said through cuts; the tensile strength of the heat seal layer being smaller than that of the substrate layer and the tear strength of the heat seal layer being greater than that of the substrate layer.

4,919,273

APPARATUS FOR SORTING METAL BARS BY LENGTH

Jan Kruit, Slootdorp, and Joannes W. J. Knapen, Utrecht, both of Netherlands, assignors to Hoogovens Groep B.V., Ijmuiden, Netherlands

Filed Feb. 6, 1989, Ser. No. 306,166
Claims priority, application Netherlands, Feb. 19, 1988, 8800425
Int. Cl.[5] B07C 5/14
U.S. Cl. 209—517 10 Claims

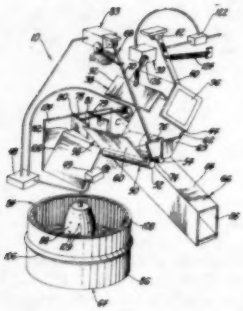


1. Apparatus for sorting elongate bars having ends by length comprising (a) a conveyor having a longitudinal direction, the bars being arranged with their lengths parallel to the longitudinal direction, said conveyor defining means for conveying the bars both longitudinally and laterally and (b) pick-up means for picking up ones of said bars having a predetermined length, said pick-up means picking up said bars at their ends and conveying said bars laterally, with respect to their lengths, thus preventing the longitudinal movement of such bars on the conveyor while bars not of said predetermined length are conveyed longitudinally at least partly past said pick-up means by said conveyor means so as to sort them from said bars having the predetermined length, said conveyor means having rotatably driven rollers of predetermined length, said rollers obliquely positioned with respect to the longitudinal direction of said conveyor to be contacted by the bars, the axis of rotation of each of said driven rollers is at a non-zero angle to the lateral direction perpendicular to the longitudinal direction of the conveyor, said obliquely positioned rollers being, over at least part of their predetermined lengths, cylindrical in shape.

4,919,274
APPARATUS AND METHOD FOR HANDLING RETURNABLE BEVERAGE CONTAINER

Nathan J. Hammond, 885 Tanglewood, E. Lansing, Mich. 48823

Filed Mar. 31, 1988, Ser. No. 175,117
Int. Cl.[5] G07F 7/06; B07C 5/00
U.S. Cl. 209—583 46 Claims



1. An apparatus (10) for handling returnable beverage containers (C) of the type having a container identification code thereon identifying the origin of the container (C) for separating returnable containers from non-returnable containers, said apparatus (10) comprising: receptacle means (20) for receiving the container (C); and separation means (22) responsive to the container code and spaced from said receptacle means (20) for separating returnable containers from non-returnable containers; said apparatus (10) characterized by said receptacle means (20) including isolation chamber means (24) having an access (26) thereto and an exit (28) therefrom, said isolation chamber means comprises means for blocking off said separation means (22) from said isolation chamber means (24) and then for simultaneously blocking off said access (26) to said isolation chamber means (24) while receiving the container (C) through said access (26) and said separation means (22) from said isolation chamber means (24) and then for passing the container (C) from said exit (28) to said separation means (22) while blocking off said access (26) to said isolation chamber means (24) to continuously prevent access to said separation means (22) through said receptacle means (20).

4,919,275
SELF LEVELING DISPENSER

Max G. Futch, 332 Wilton Dr., Baton Rouge, La. 70895, and Ronald H. Drushel, Baton Rouge, La., assignors to Max G. Futch

Continuation of Ser. No. 264,089, Oct. 28, 1988, abandoned. This application Sep. 25, 1989, Ser. No. 411,686
Int. Cl.[5] A47F 3/08
U.S. Cl. 211—1.5 14 Claims

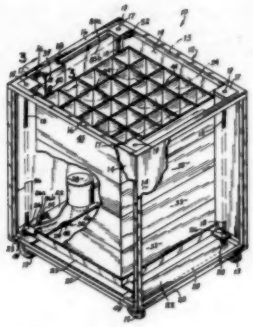
1. A self leveling dispenser comprising

a rack supported for vertical movement relative to ground, said rack being adapted to support a desired number of trays in stacked arrangement one on top the other,

at least one drive shaft connected to said rack for rotation with respect thereto,

a reversible motor drivably connected to said drive shaft, and

a sensor device located above said rack and operatively connected to said motor, said sensor functioning to sense the presence and absence of trays at the vertical location of said sensor to automatically and continuously raise and lower said rack upon removal or addition of a tray or trays

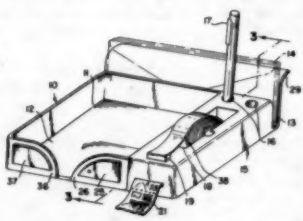


so that a top tray on said rack will be located at a desired dispensing height relative to ground.

4,919,276
PORTABLE DESK TOP TRAY

Yun S. Kim, and Mee S. Kim, both of 5702 Oak Stake Ct., Burke, Va. 22015

Filed Feb. 17, 1989, Ser. No. 311,852
Int. Cl.[5] A47F 7/00
U.S. Cl. 211—13 4 Claims



1. A portable desk top tray for organizing and arranging a plurality of desk implements which comprises:

a main frame,

a memo sheet depression formed in said main frame for receiving memo pads,

an envelope container for containing a plurality of letters and envelopes, said envelope container being formed by extending an outward bent wall from the rear side wall of said main frame,

a hollow body extended from the one side wall of said main frame, said hollow body defining a first box, a second box, and a third box, said first box including a bottom opening and a front opening for inserting a roll of stamps into and dispensing stamps therefrom, one by one, said second box including a roll of tape disposed therein for dispensing a tape from the roll of tape through a tape cutter supported on the top of said first box, said third box including a plurality of writing device holders with a conical configuration, respectively, for receiving various types of writing devices, and

an "L" shaped envelope opener slidably engaged in an elongated channel disposed in said hollow body, said envelope opener having a blade portion and a handle with an aperture for being adapted to engage in a pin disposed on one outside wall of said main frame, whereby the desk top tray

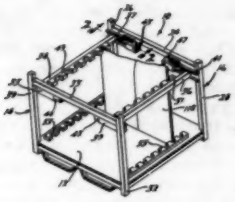
is compact and attractive and is arranged in a readily accessible manner.

4,919,277

SHIPPING RACK INCLUDING DUNNAGE BAR LOCKING MECHANISM

Thomas M. Jeruzal, Brighton, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Mar. 20, 1989, Ser. No. 325,798
Int. Cl.[5] A47G *19/08*
U.S. Cl. 211—41 10 Claims



1. A shipping rack comprising a bottom wall having upstanding oppositely disposed end walls and sides, channel structure provided on an inner face of each end wall, the channel structure extending laterally with respect to the rack, a dunnage bar on each side of the shipping rack, the ends of the dunnage bars being slidably received in a respective channel structure, a dunnage bar locking mechanism on each end wall adjacent each end of each dunnage bar, each locking mechanism including a housing secured to an end wall of the rack, a piston element mounted within the housing for reciprocal movement, the piston element being secured to the end of the adjacent dunnage bar, the piston element being hollow, spring means positioned within the piston element, a handle pivotally mounted to the housing, means interconnecting the handle to the spring means, the handle having an open position wherein the spring means is relaxed permitting easy dunnage bar sliding in the channel structure outwardly of the rack to facilitate loading and unloading of the rack and a closed position wherein the spring means is compressed causing the piston element to draw the dunnage bar inwardly of the rack against a rack load to stabilize the load, the piston element being thereafter movable in either direction under impact forces exerted on the attached dunnage bar to permit dunnage bar movement during absorption of the impact forces.

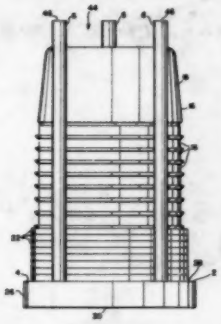
4,919,278

HOLDER FOR CONTAINERS AND COVERS

Phillip J. Howen, 2541 Crystal Dr., Joliet, Ill. 60435

Continuation of Ser. No. 205,971, Jun. 13, 1988, abandoned.
This application Jan. 31, 1989, Ser. No. 304,072
Int. Cl.[5] A47F *7/00*
U.S. Cl. 211—49.1 15 Claims

1. The combination of a holder for empty food containers, empty food containers stacked therein, and covers for said empty food containers also stacked therein, in which each empty food container has a first peripheral dimension and a first cross-sectional dimension at its widest point, said covers having a cross-sectional dimension corresponding to that of said food containers at said widest point to be received on said food containers, said holder comprising a base, a first upwardly extending retaining member positioned on said base at a first base position, a second upwardly extending retaining member positioned on said base at a second base position, and a third upwardly extending retaining member positioned on said base at a third base position, including said first, second and third base positions, said first, second and third upwardly extending retaining members in said first, second and third base position being spaced apart a sufficient distance to receive at least a first one of said empty food containers having said first peripheral dimension and a first one of said covers therebetween, the distances between said first base position and said second base position, between said first base position and said third base position, and between said second base position and said third



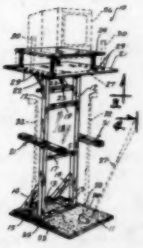
base position each respectively being smaller than said first cross-sectional dimension of said each empty food container and cover therefore, including said empty food containers stored in nesting relationship and said covers therefore stored in stacking relationship in said holder.

4,919,279

MAGNETIC GOLF CLUB HOLDING APPARATUS

Gregory A. Crump, 4100 - 65th St., Urbandale, Iowa 50322

Filed Apr. 19, 1988, Ser. No. 183,081
Int. Cl.[5] A47F *7/00*
U.S. Cl. 211—70.2 11 Claims



1. A magnetic golf club holding apparatus comprising:
a first magnet having a north pole and a south pole;
a second magnet having a north pole and a south pole;
means for holding said first and second magnet in a spaced apart relationship wherein the north pole of the first magnet is a first predetermined distance from the south pole of said second magnet and the south pole of the first magnet is a second predetermined distance from the north pole of the second magnet, said first and second predetermined distances forming a gap short enough to cause magnetic lines of flux to extend from the first magnet to the second magnet;
a golf club including a shaft attached to a golf club head, said head being constructed of a material attracted to magnetic forces, said golf club head having a top, a bottom and two sides, said bottom spanning across the top of said gap between said first and second magnets and thereby being held securely in such position whereby said handle will be

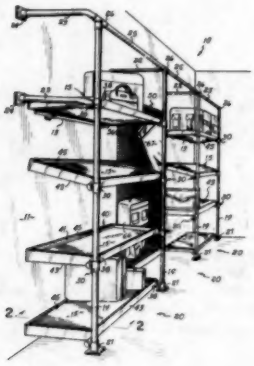
held upwardly and away from said first and second magnets in an address position.

4,919,280

MERCHANDISING SYSTEM

Kenneth A. Phillips, Warwick, R.I., assignor to American Tourister, Inc., Warren, R.I.

Filed Jan. 23, 1989, Ser. No. 299,129
Int. Cl.[5] A47F *5/08*
U.S. Cl. 211—87 **4 Claims**



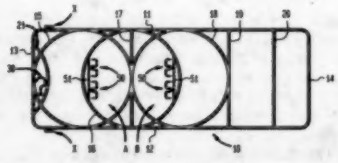
1. A merchandising system comprising,
a wall,
a first set of a plurality of brackets mounted on said wall in vertically spaced relation, each said bracket having a horizontally projecting leg,
at least two vertical poles spaced from said wall and opposite said brackets,
a plurality of cross fittings mounted on each of said poles, each said cross fitting having a horizontal cylinder, each said bracket having a pair of said cross fittings opposite each said bracket,
cylindrical horizontal sleeves in the cylinders of said cross fittings, said sleeves having slotted projecting portions,
and a shelf having a front edge mounted in each pair of said slotted portions of said sleeves and a back edge mounted on each said bracket.

4,919,281

FABRIC BOLT HANGER

Myron Ullman, Canfield, Ohio, assignor to Boardman Molded Products, Inc., Youngstown, Ohio

Filed Dec. 8, 1988, Ser. No. 283,384
Int. Cl.[5] A47F *5/08*
U.S. Cl. 211—116 **9 Claims**



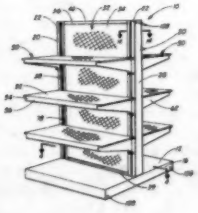
1. A rack for bolts of fabric, comprising:
a molded plastic unitary frame structure having overall length and width dimensions of a size selected to accommodate the length and width dimensions of a bolt of fabric contemplated to be formed thereon and supported thereby,
said unitary frame structure including outer perimeter slender members forming a generally rectangular support frame and including an upper shorter slender member and longer slender members, and secondary reinforcement members interconnected with one another and with said outer perimeters members, at least one of said reinforcement members having curvilinear portions, said members lying substantially in a plane,
a hanger hook member interconnected with said upper shorter slender member of the frame structure, and
fabric holders interconnected with the longer slender members of the frame structure at locations on the longer slender members adjacent said upper shorter slender member, each said fabric holder comprising:
a hook bar including a plurality of piercing hooks for attaching the fabric, said hook bar being disposed substantially perpendicular to the plane of said frame structure,
whereby when said frame structure is suspended from a support by said hanger hook, said piercing hooks extend upwardly so that fabric can be wound about and supported on said frame structure while being secured to said frame structure by hooking engagement of said fabric with said piercing hooks.

4,919,282

MOVABLE GONDOLA SHELVING WITH HIDDEN SHELF ADJUSTMENT MECHANISM

Terry L. Duff, 1201 Carson Dr., Seminole, Okla. 74868, and William R. Gundlach, 2 Seneca, Shawnee, Okla. 74801

Filed May 13, 1987, Ser. No. 50,640
Int. Cl.[5] A47F *5/00*
U.S. Cl. 211—134 **16 Claims**



1. A merchandise display unit positionable on a surface, comprising:
a base unit, comprising:
a platform;
a pair of spaced apart standards extending upward from the platform, each standard defining at least one strip having a thickness and characterized by a front and back surface;
at least one cantilevered shelf supportable on the standards, each shelf characterized by a pair of support members, one at each rear corner of the shelf, each having a back portion adapted for frictionally engaging the front surface of the strip, and each shelf comprising a pair of cam assemblies mounted on the shelf opposite the back portion of each support member so that a portion of the strip is receivable therebetween, wherein each cam assembly comprises:
a cam plate adapted for frictional engagement with the back surface of the strip and mounted for pivotation between an open position and a closed position, wherein in the open position the cam p te is spaced a distance from the back portion of the support mem-

ber of the shelf which is greater than the thickness of the strip to permit the shelf to be moved along the strip disposed therebetween, and wherein in the closed position the cam plate is spaced a distance from the back portion of the support member which is narrower than the thickness of the strip so that as the cam plate is pivoted toward the closed position, the cam plate engages the back surface of the strip and the back portion of the support member engages the front surface and the strip thereby is gripped between the cam plate and the back portion of the support member so that the shelf is rigidly mounted on the standard at the point of engagement; and

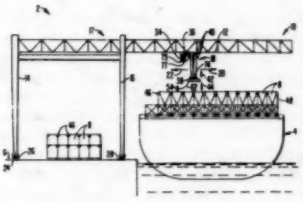
means for continuously urging the cam plate toward the closed position.

4,919,283

CONTAINER SHIP WORKER SAFETY SYSTEM

Robert E. Riley, San Rafael, and John McNeill, Concord, both of Calif., assignors to Marine Terminals Corporation, San Francisco, Calif.

Filed Jan. 28, 1988, Ser. No. 149,344
Int. Cl.[5] B66C *13/44*
U.S. Cl. 212—160 **10 Claims**



8. A safety system, for use by workers on top of levels of containers on container ships, such as when the workers are used to place and retrieve stacking cones while loading and unloading the container ships, using an overhead trolley crane of the type having a frame movable in forward and aft gantry directions, an operator's station housing a crane driver and supported by the frame, an overhead track supported by the frame, and a trolley which moves along the overhead track in on shore and off shore trolley directions, the trolley including a container bridle, the bridle movable in hoist and lower directions, the movement of the bridle being controlled by the crane driver through a movement control system, the safety system comprising:

a safety line;

the safety line including a coupling for selectively connecting the worker to the bridle through the safety line:

status signaling means, coupled to the movement control system, for visually signaling at least first, second and third operational statuses of the crane to the worker;

the first, second and third operational statuses being stopped, slow speed and normal speed operational statuses of the bridle;

override means, coupled to the movement control system, for preventing movement of the bridle when actuated; and

switch means, actuated by the worker, for actuating the override means;

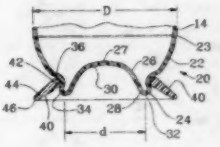
whereby all movement of the bridle can be at least temporarily prevented through the actuation of the switch means.

4,919,284

PLASTIC CONTAINER WITH RING STABILIZED BASE

William H. Tiedemann, Cedarburg, and Dennis L. Marshall, Wauwatosa, both of Wis., assignors to Hoover Universal, Inc., Ann Arbor, Mich.

Filed Apr. 10, 1989, Ser. No. 335,998
Int. Cl.[5] B65D *25/24*
U.S. Cl. 215—12.1 **13 Claims**



1. A plastic container for carbonated beverages comprising:

a tubular body having an upright sidewall and a base structure extending downwardly from said sidewall so as to close the lower end of said tubular body, said base structure including an upwardly concave bottom wall at the center of said base structure, a heel portion at the periphery of the bottom wall forming the lowermost portion of said tubular body and having a diameter less than the diameter of the sidewall and an outer wall having a lower end merging with said heel portion and an upper end merging with said sidewall, said outer wall inclined radially inwardly and upwardly from said lower end to form a radially inwardly recessed portion in said outer wall, said outer wall extending upwardly and radially outwardly from said recessed portion to said outer wall upper end; and

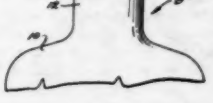
a stabilizing ring seated in said recessed portion and extending radially outwardly and downwardly from said outer wall, said stabilizing ring terminating at a lower end portion radially outwardly and axially downwardly of said heel portion to form a support surface for said container radially outwardly of said heel portion to stabilize said container against tipping, said outer wall being flexible so that when the container is filled, the lower end of the outer wall below said recessed portion is forced to move outwardly and prevents removal of the ring.

4,919,285

TAMPER EVIDENT CLOSURE AND METHOD OF MANUFACTURE OF THE SAME

William M. Roof; Eric J. Roberts, both of Louisville, and Dennis P. Blair, Prospect, all of Ky., assignors to Thoroughbred Plastics Corp., Louisville, Ky.

Filed May 11, 1988, Ser. No. 192,564
Int. Cl.[5] B65D *41/34*
U.S. Cl. 215—230 **42 Claims**



1. A tamper evident closure for use on a container having a

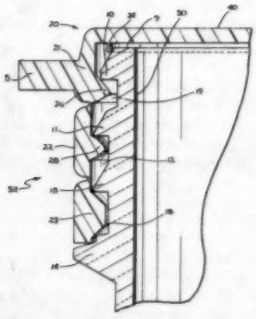
neck provided with a mouth, cap retaining means and including a shoulder disposed below the cap retaining means thereof, said closure comprising a cap, a security ring formed disjunctively from said cap, and fused bridge means for interconnecting said security ring to said cap, said cap including retaining means adapted to cooperate with the cap retaining means of the container neck thereby to retain said cap on the container neck as juxtaposed for closing the mouth thereof, said security ring including anchor means disposed to pass over and catch beneath the shoulder of the container when said cap is juxtaposed on the container neck for closing the mouth thereof, and said fused bridge means comprise frangible zones of weakness adapted to rupture during removal of said cap from said container neck whereby to enable said security ring to break away from said cap, said anchor means being engageable with the shoulder of the container neck for retaining said security ring on the container neck when said cap is removed therefrom.

4,919,286

HINGED CLOSURE AND CONTAINER

Albert J. Agbay, Sr., Worcester, Mass., assignor to Robert Linkletter Assoc., Shrewsbury, Mass.

Filed May 27, 1988, Ser. No. 199,672
Int. Cl.[5] B65D *41/34*
U.S. Cl. 215—235 **10 Claims**



1. A container and closure combination comprising:

a container having a neck terminating in a top rim defining a mouth with an external cap latch extending outwardly from said top rim of said neck, a cap restraint which protrudes externally from said neck below said cap latch so as to have a cavity between said cap latch and said cap restraint, a base ceiling which protrudes externally from said neck below said cap restraint so as to have a groove between said base ceiling and said cap restraint, a base rest which protrudes externally from said neck below said base ceiling so as to have a depression between said base ceiling and said base rest;

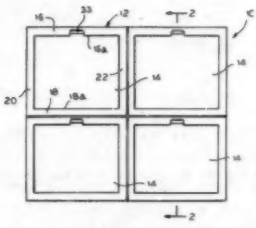
a closure having a cap cover, a tear strip, a hinge and an anchor band, said cap cover having a protruding circumferential exterior sealing flange that abuts the external circumference of the top rim, said cap cover having no other annular protrusion from the underside of the cap cover within the circumference of the top rim which serves to assist in forming a seal with said container, said cap cover having an inwardly facing sealing rib such that when said cap cover is closed on said container said sealing rib abuts and engages said cap latch to secure said cap cover on said container, said hinge connecting said cap cover to said anchor band, said anchor band being located in said depression between said base ceiling and said base rest to secure said closure to said container, said tear strip being attached to said cap cover and said anchor band over at least a portion of the circumference of said tear strip except for the portion of the circumference of said closure where a thin membrane and said hinge occurs, said tear strip having an inwardly protruding locking bead over at least a portion of the interior side of said tear strip, said locking bead cooperatively engaging said cap restraint to securely retain said cap cover on said container.

4,919,287

DISPLAY UNIT FOR CONSUMER PRODUCTS

Wayne J. Haskett, 10443 S. Natoma, Chicago Ridge, Ill. 60415; Leonard Andersen, 5361 W. Otto Pl., and John A. Andersen, 10215 S. Kildare, both of Oak Lawn, Ill. 60453

Filed Jun. 3, 1988, Ser. No. 202,216
Int. Cl.[5] A47G *19/08*
U.S. Cl. 211—41 **10 Claims**



1. A display unit for a plurality of consumer products, comprising:

a frame having a plurality of generally rectangular consumer product-receiving openings adapted to receive said consumer products therewithin, said openings each being defined by parallel top and bottom frame portions joined by parallel side frame portions, said frame having a front side through which said consumer products can be placed in said consumer product-receiving openings and a rear side opposite thereof;

said top and bottom frame portions of each of said consumer product-receiving openings being spaced apart by a greater distance than the corresponding vertical dimension of said consumer products and said side frame portions of each of said consumer product-receiving openings being spaced apart by a distance substantially the same as the corresponding horizontal dimension of said consumer products;

a substantially continuous inwardly projecting flange associated with each of said top and bottom frame portions of each of said consumer product-receiving openings, said substantially continuous inwardly projecting flanges being spaced apart by a lesser distance than the corresponding vertical dimension of said consumer products but being spaced apart by a distance sufficient to permit insertion of said consumer products at an oblique angle to the plane of said frame and to permit pivoting of said consumer products into said opening under said flanges and being such that said consumer products can be repeatedly inserted into said consumer product-receiving openings and removed from said consumer product-receiving openings on demand only from said front side of said frame, said substantially continuous inwardly projecting flanges also being adapted to retain said consumer products in said consumer product-receiving openings until said consumer products are removed on demand; and

barrier means integrally associated with said rear side of said frame so as to permit insertion of said consumer products into said consumer product-receiving openings only through said front side thereof, said barrier means being defined by a rear wall integral with said rear side of said frame in spaced relation to said front side of said frame by

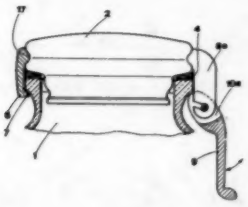
substantially the same distance as the width dimension of said consumer products.

4,919,288

HERMETIC SEAL DEVICE FOR GLASS JARS

Roberto L. Monti, Roma, Italy, assignor to Vetreria Parmense Bormioli Rocco S.p.A., Parma, Italy

Filed Apr. 18, 1989, Ser. No. 339,780
Claims priority, application Italy, Jun. 8, 1988, 40091 A/88
Int. Cl.[5] B65D *45/02*
U.S. Cl. 215—284 **6 Claims**



1. A hermetic seal device for glass jars, of the type designed to compress an annular sealing element (4) permanently between the glass lid (2) and the neck of the jar (1), comprising:

a collar (5), fastened stably to the periphery of the lid (2), incorporating a lip (6) shaped and positioned in such a way as to locate beneath an annular rim (7), afforded by the neck of the jar, when the assembled lid and collar are applied to the neck of the jar, and a protruberance (8) the bottom end of which extends below the level of the annular rim (7) when the assembled lid and collar are applied to the neck of the jar;

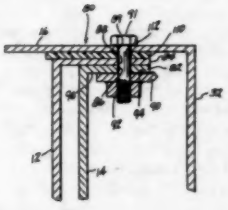
a lever (9), pivotably suspended from the bottom end of the protruberance and comprising an arm (10*a*, 10*b*) with a cam profile having a notch (11) that permits of halting the rotation of the lever on arrival at a given stable position, which, when the assembled lid and collar are applied to the neck of the jar and the lever rotated, engages with the annular rim afforded by the neck of the jar and to the protruberance a force that draws the collar and lid toward the jar.

4,919,289

PORTABLE STORAGE TANK

Peter A. Bartis, 105 East View Terr., Meriden, Conn. 06450

Continuation-in-part of Ser. No. 135,058, Dec. 18, 1987, Pat. No. 4,815,621. This application Mar. 3, 1989, Ser. No. 318,233
The portion of the term of this patent subsequent to Jan. 28, 2006, has been disclaimed.
Int. Cl.[5] B65D *90/00*
U.S. Cl. 220—1 B **15 Claims**



1. A container for storing liquids which comprises:

a primary tank for holding liquid to be stored;

a secondary tank substantially surrounding said primary tank, said secondary tank containing said stored liquid in the event of the failure of said primary tank;

a cover for closing at least said secondary tank;

means for securing said cover to at least one of said tanks;

said cover securing means including a flange member associated with at least one of said tanks, at least one aperture in said flange member, at least one aperture in said cover, each said cover aperture being alignable with a flange aperture so as to form a mating set of apertures, a fastener passing through each said mating set of apertures and means for engaging said fastener so as to fix said cover in said closed position; and

an inlet box attached to said cover, said inlet box having means for introducing liquid into and for withdrawing liquid from said primary tank and means for preventing access to said liquid introducing and withdrawing means.

4,919,290

RECYCLING WASTEBASKET

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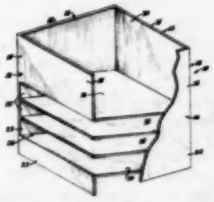
Filed Mar. 17, 1989, Ser. No. 325,142
Int. Cl.[5] B65D *25/04*
U.S. Cl. 220—1 T **4 Claims**



1. An open-topped wastebasket for the disposal of discard items in a sorted manner for expediting reclamation thereof, the wastebasket comprising:

a bottom panel,

upstanding side walls having upwardly-extending portions extending a substantial distance upwardly of the bottom panel,

the upwardly-extending portions co-operating with the bottom panel to provide an open-topped hopper for discard items,

the wastebasket being improved by means providing for the storage of discard items in a sorted manner, and comprising the following in combination with such a wastebasket:

the provision that the wastebasket's upstanding side walls have downwardly-extending portions extending a substantial distance downwardly of the wastebasket's bottom panel,

and there is also provided a plurality of receptacle means below the said bottom panel of the wastebasket, for receiving, respectively, different types of discard items,

the said downwardly-extending portions providing a plurality of functions as follows:

(a) they provide a base for the wastebasket which supports

the wastebasket substantially above a supporting floor, and

(b) the said downwardly-extending portions also provide means for supporting the receptacle means, and

(c) the said downwardly-extending portions also provide an enclosure for the receptacle means; and

in which the receptacle means includes receiver trays; and there are support members, which are supported by the downwardly-extending portions of the upstanding side walls, and which support the receptacle means for sliding in and out of the wastebasket; and

in which the support members provide a downwardly slanting front-to-rear support of the receiver trays, such that when installed in the wastebasket they slant downwardly from front to rear.

3. A salvage-facilitation device, in a combination including an open-topped wastebasket hopper, for providing for the disposal of a plurality of types of salvageable discard items in a sorted and sorted-storage manner for expediting the reclamation thereof, the device comprising:

a panel and upstanding side walls, the panel providing a bottom panel of the wastebasket hopper,

and the upstanding side walls having upwardly-extending portions extending a substantial distance upwardly of the panel, and also having downwardly-extending portions extending a substantial distance downwardly of the panel,

the upwardly-extending portions co-operating with the panel to provide an open-topped wastebasket hopper for discard items,

the device also providing for the sorting and sorted storage of salvageable discard items, by providing, in combination with such a wastebasket hopper, a plurality of receptacle means, below the said bottom panel of the wastebasket hopper, for receiving, respectively, different types of discard items,

the said downwardly-extending portions providing a plurality of functions as follows:

(a) they provide a base for the wastebasket hopper which supports the wastebasket hopper substantially above a supporting floor, and

(b) the said downwardly-extending portions also provide means for supporting the receptacle means, and

(c) the said downwardly-extending portions also provide an enclosure for the receptacle means; and

in which the receptacle means include receiver trays; and there are support members, which are supported by the downwardly-extending portions of the upstanding side walls, and support the receptacle means for sliding in and out of the device; and

in which the support members provide a downwardly slanting front-to-rear support of the receiver trays, such that when installed in the device they slant downwardly from front to rear.

4,919,291

METALLURGICALLY IMPROVED TIP-OFF TUBE FOR A VACUUM ENCLOSURE

Timothy S. Romano, Goleta, and Kenneth L. Gustafson, Buellton, both of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed Nov. 23, 1987, Ser. No. 124,220

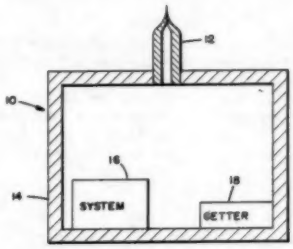
Int. Cl.[5] H01J 9/26; H01K 3/12

U.S. Cl. 220—2.2 **7 Claims**

1. A hollow elongated vacuum sealing member, said member being operable for having a compressive force applied thereto for crimp sealing an inner portion of said member, said member comprising:

a hollow metallic tubular substrate comprising an inner and an outer surface; and

a metallic layer comprised of a noble metal formed upon at least said inner surface of said substrate, said layer being



diffused to a predetermined depth within at least said inner surface.

4,919,292

REINFORCED JUNCTION BOX ASSEMBLY

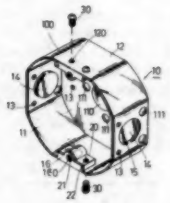
Tsui-Chen Hsu, No. 12, Alley 66, Lane 275, Nan-Tun Rd., Sec. 1., Taichung, Taiwan

Filed Feb. 10, 1989, Ser. No. 309,781

Claims priority, application Taiwan, Jan. 11, 1989, 77/200,240

Int. Cl.[5] H02G 3/08

U.S. Cl. 220—3.2 **2 Claims**



1. A reinforced junction box assembly having a polygonal open housing body formed with a top surface on one side thereof, a plurality of side walls vertically located along a periphery of the top surface, and at least one pair of holding flanges, each one of which has a guide opening in a middle portion thereof, integrally formed along each outer edge of two opposing side walls of the open housing body for providing an anchor position thereat; the improvement comprising:

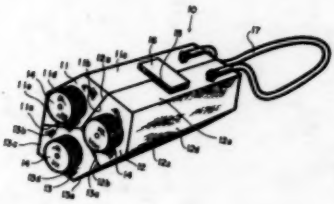
at least one pair of mounting means, each having a reinforced ridge formed between two mounting sides thereof with a threaded bore extending through said reinforced ridge, and a plurality of screw holes formed in said mounting sides for fixing the mounting means on an interior surface of the two opposing side walls of the housing body against the holding flanges thereof, with the threaded bores of said mounting means aligned with the guide openings of the holding flanges; both of said mounting means being fixed to an interior surface of the two opposing side walls against the holding flanges, whereby safe connections between said mounting means and a suspension load can be effectively made through the guide openings of the holding flanges and the threaded bores of said mounting means.

4,919,293

MULTI-UNIT DISPENSING CONTAINER ASSEMBLY

Paul Buckley, 78 Orchard St., Cranston, R.I. 02910

Filed Jun. 2, 1989, Ser. No. 360,427
Int. Cl.[5] B65D *37/00, 85/67*
U.S. Cl. 220—23.2 10 Claims



1. A multi-unit dispensing container assembly, comprising:

(a) a plurality of separate, elongate polygonal tubular dispensing containers which fit together in surface-to surface contact, each of said containers comprising a plurality of longitudinally-extending side walls, and first and second end walls on opposite ends of and integral with said side walls, and a closable opening positioned in one of said end walls, at least one of said side walls of each of said containers being adjacent to one of said side walls of another of said containers, and at least one of said side walls of each of said containers being non-adjacent to another of said side walls of another of said containers; and

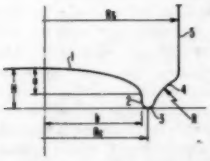
(b) hinge means connecting said containers along side edges of said adjacent side walls to permit movement of said containers between a closed position in which said adjacent side walls fit flush together, and said non-adjacent side walls abut to form a single planar surface; and an open position in which said adjacent side walls are spaced from each other except at said side edges of said adjacent side walls.

4,919,294

BOTTOM STRUCTURE OF A THIN-WALLED CAN

Yoji Kawamoto; Tetsuo Yuhara, both of Nagasaki; Koichi Takagi, Nagoya, and Kanji Udagawa, Sunto, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha and Mitsubishi Metal Corporation, both of Tokyo, Japan

Filed Apr. 6, 1989, Ser. No. 334,853
Claims priority, application Japan, Apr. 6, 1988, 63-83135; Mar. 9, 1989, 64-54874
Int. Cl.[5] B65D *7/42*
U.S. Cl. 220—70 3 Claims



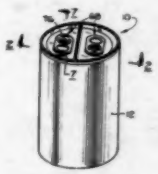
1. A bottom structure of a thin-walled can, said structure comprising a dome section having a cross-sectional shape formed of a curve whose radius of curvature changes substantially continuously, and a counter section contiguous to said dome section and formed so as to align with the direction of extension of said dome section.

4,919,295

MULTI-CELL DRINK CONTAINER

Terry Hitzler, 850 Saylor, Elmhurst, Ill. 60126

Filed Aug. 21, 1989, Ser. No. 396,309
Int. Cl.[5] B65D *21/00*
U.S. Cl. 220—23.83 8 Claims



1. A multi-cell container comprising,

a cylindrical can having an originally open top,

a cup shaped insert in the can, and having an open top and being otherwise continuous,

the insert defining a first space for holding a liquid, and the can defining a second space surrounding the insert, also for holding a liquid,

means mounting the insert in the container with the open top of the insert essentially in the same plane with the open top of the can, and

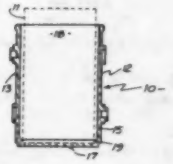
cover means secured to the can sealingly closing both said spaces and including separate openable closure members operably associated with respective said spaces.

4,919,296

CONTAINER

Janet A. Kirsh, Main Road; Cheryl A. Longobardi, Lot 884 Lieberts Lane, both of Brunkerville, New South Wales, 2323, and Thomas Kirsh, Brunkerville, all of Australia, assignors to Janet A. Kirsh and Cheryl A. Longobardi, both of Brunkerville, Australia

Filed Jul. 20, 1988, Ser. No. 221,861
Claims priority, application Australia, Jul. 20, 1987, PI3198
Int. Cl.[5] B65D *1/30*
U.S. Cl. 220—85 H 5 Claims



1. A substantially rigid receptacle to receive a relatively flexible drink container of rectilineal form, said receptacle being hollow and integrally moulded of plastics material so as to have a base, four sides and an open top, the sides being generally normal to the base, and arranged in parallel pairs, with the sides of one pair being generally normal to the sides of the other pair, said base and side walls encompassing a hollow to receive said container so that the container can be manipulated by a user gripping the receptacle without transferring any substantial compression force to the container, and wherein at least one of the sides has a projection, and another side has a recess so that two or more receptacles may be secured together by mating engagement of one of the projections of one of the receptacles with one of the recesses of another receptacle.

4,919,297

FUEL INJECTION PORT

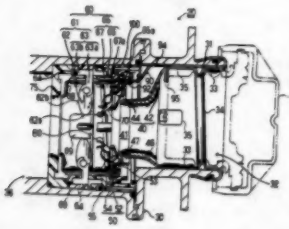
Tamiyosi Ohasi, Aichi, Japan, assignor to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Mar. 2, 1989, Ser. No. 318,182

Claims priority, application Japan, Mar. 7, 1988, 63-053383; Jun. 14, 1988, 63-146148; Oct. 17, 1988, 63-261152

Int. Cl.[5] B67D *5/04*

U.S. Cl. 220—86 R **19 Claims**



1. A fuel injection port comprising:

a cylindrical casing provided with an inlet to insert a fuel injection nozzle and an outlet continuing to a fuel tank;

a nozzle guide means fixed to inner circumferential surface of said casing and having a guide port to pass said nozzle therethrough;

an annular seal means positioned to the back side of said nozzle guide means for sealing outer circumferential surface of said nozzle;

a seal means enlarging surface arranged face to said seal means;

a biasing means for making one abut on the other among said seal means and said seal means enlarging surface and for enlarging the inner circumferential surface of said seal means at least immediately before said nozzle is inserted in the furel injection port; and

a moving means for moving one in direction separating from the other among said seal means and said seal means enlarging surface in interlocking with insertion of said nozzle against biasing force of said biasing means and for releasing the enlarging of said seal means so that the inner circumferential surface of said seal means abuts on the outer circumferential surface of said nozzle.

4,919,298

TRIM BUCKET

Steven R. Gregory, 1459 Palisades Dr., Pacific Palisades, Calif. 90272

Continuation-in-part of Ser. No. 67,209, Jun. 29, 1987, abandoned. This application Jul. 19, 1988, Ser. No. 221,130

Int. Cl.[5] B65D *25/28*

U.S. Cl. 220—94 R **6 Claims**

1. A paint bucket for use in painting trim or the like comprising:

a cylindrical container having a bottom, a cylindrical side wall and an open top, the side wall having a height less than the diameter of the container;

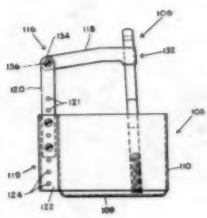
handle and brush rest means connected to the side wall of the container, the handle and brush rest means including

a generally vertically extending connecting section having an upper end portion and a lower end portion, the lower end portion being rigidly interconnected to the container,

a generally horizontally extending gripping section interconnected at one end thereof to the upper end portion of the connecting section, the gripping section having a portion extending over the center of gravity of the container for gripping with a hand to transport the container, and

a pair of spaced finger members interconnected to the other end of the the gripping section and adapted to nestingly accept a handle of a paint brush therebetween when the brush is oriented bristle-end down within the container;

the handle and brush rest means being connected to the side wall of the container so that when a working amount of



paint is placed within the container and the handle of a paint brush is operatively placed between the spaced finger members only the bristle-end of the brush will extend into the paint within the container thereby preventing the bristles from drying out while eliminating excess paint from getting onto the paint brush.

4,919,299

CONTAINER ASSEMBLY AND METHOD OF CONSTRUCTING SUCH AN ASSEMBLY

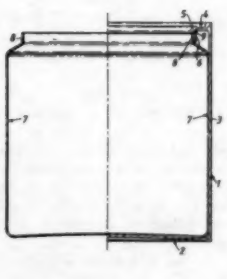
Peter R. Haines, Skelmersdale, United Kingdom, assignor to Lin Pack Mouldings Limited, Birmingham, United Kingdom

Filed Jun. 3, 1988, Ser. No. 202,832

Claims priority, application United Kingdom, Jun. 5, 1987, 8713252

Int. Cl.[5] B65B *3/00*

U.S. Cl. 220—404 **7 Claims**



1. A container assembly comprising an outer open topped container part formed of a first plastics material having a base and an upwardly extending side wall; an open topped inner container part formed of a second plastics material and located and secured to provide a liner within the outer container part, said liner extending within the outer container part downwardly from an internal peripheral flange at the open top of the outer container part; a removable lid, said lid being fitted to said flange to form a seal with the inner container part, said lid having a closure face of the second plastics material whereby the assembly forms a sealed chamber defined by the second plastics material; said internal flange being provided on the outer container part and being of the first plastics material, said flange comprising a cylindrical skirt which extends downwardly therefrom; said inner container part having a cylindrical neck which is closely received within said cylindrical skirt, and wherein the closure face of the lid is in sealing abutment

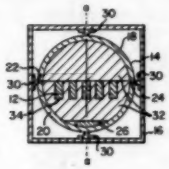
with the interior of said neck, and said neck of said liner having a rim which is closely received in an annular rebate in said flange.

4,919,300

SHIPPING DEVICE

Kristy L. Anderson, Allegheny County, and Edward R. Bollinger, Westmoreland County, both of Pa., assignors to RJ Lee Group, Inc., Monroeville, Pa.

Filed Mar. 31, 1989, Ser. No. 332,527
Int. Cl.[5] B65D *81/00*
U.S. Cl. 220—408 **16 Claims**



1. A device for transporting an item in a specific orientation comprising:

(a) a housing comprising a cubical frame having six faces wherein at least one face is removably fastened to said frame;

(b) a container concentrically positioned within said housing for receiving said item;

(c) means for counterbalancing said container within said housing and for at least counterbalancing a weight of said item; and

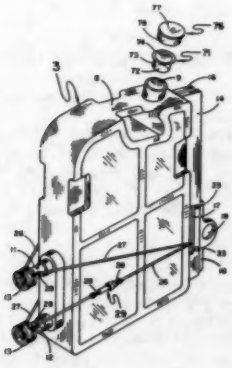
(d) bearing means to permit rotation of said container relative to said housing whereby, in use, as an orientation of said housing is altered, said container rotates within said housing responsive to said counterbalancing means to maintain said container in a specific orientation.

4,919,301

FLUID RESERVOIR STRUCTURE FOR A FLUID SYSTEM

Steven L. Miller, Shelby County, Ky., assignor to Environmental Water Technology, Inc., Louisville, Ky.

Filed Feb. 13, 1989, Ser. No. 309,187
Int. Cl.[5] B65D *25/00*
U.S. Cl. 220—85 S **26 Claims**



1. A fluid reservoir structure for supplying treating fluid to be circulated through a fluid system, the fluid system including quick connect fittings and having a fluid pump associated therewith to receive and circulate treating fluid from said fluid reservoir structure through said fluid system and fluid reservoir structure during a circulating mode comprising:

fluid receptacle means adapted to receive and store treating fluid from a preselected supply source to be circulated through said fluid system and said fluid receptacle means when said fluid receptacle means is connected to said fluid system;

spaced fluid inlet and outlet conduits mounted on a wall of said fluid receptacle means;

adjustable quick connect fittings on said spaced fluid inlet and outlet conduits on said fluid receptacle means to matingly engage with said quick connect fittings in said fluid system during a fluid circulating mode; and,

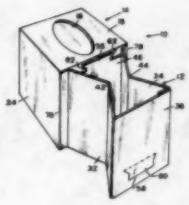
actuating means to remotely actuate said adjustable quick connect fittings on said spaced conduits for engagement with said quick connect fittings of said fluid system during a fluid circulating mode.

4,919,302

TISSUE BOX WITH DISPOSAL COMPARTMENT

Donald S. McPherson, P.O. Box 156, Murphy, Oreg. 97533

Filed Jan. 23, 1989, Ser. No. 299,348
Int. Cl.[5] B65H *1/04*
U.S. Cl. 221—34 **5 Claims**



2. A tissue box with disposal compartment, which comprises:

a. a new tissue dispensing compartment, which includes:

(1) a top wall, having a opening formed for the dispensing of tissues;

(2) a bottom wall;

(3) four side walls oriented at right angles to said top and bottom walls; and

b. a used tissue disposal compartment, integrally attached to said new tissue dispensing compartment and having, relative to said new tissue dispensing compartment, a folded position for transport and storage and an extended position for use, said used tissue disposal compartment comprising:

(1) four side walls, where:

(a) a first side wall is common to a substantial portion of one of the four side walls of said new tissue dispensing compartment;

(b) a second side wall and a third side wall which extend at right angles to the first side wall and are spaced to form opposing side walls in said extended position;

(c) said second and third side walls being foldable so as to lie in proximity to said first side wall while in the folded position;

(d) a fourth side wall connected to said second and third side walls so that, with the second and third side walls in the extended position, the fourth side wall forms a spaced and opposing side wall to said first side wall; and when the second and third side walls are in the folded position, the fourth side wall is substantially parallel to and in the proximity to the first side wall;

(2) a bottom wall which is foldingly attached to the first

side wall lower end so that when in the folded position it lies substantially parallel to and in proximity to the first side wall, and in the extended position, unfolds to form the bottom of the used tissue disposal compartment; and

(3) means for attaching said bottom wall to said fourth wall in the extended position, which includes:

(a) a tab extending from the bottom wall;

(b) a tab opening in the lower portion of said fourth side wall, formed so that when the side walls are in extended position, and the bottom wall is unfolded to form the bottom of the compartment, the tab will engage in said tab opening.

4,919,303

METHOD FOR FEEDING PARTICULATE MATERIAL

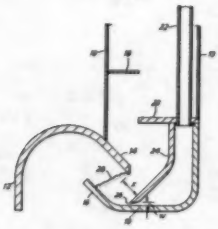
Ghislain Boudreault, Chicoutimi, Canada, assignor to Alcan International Limited, Montreal, Canada

Continuation-in-part of Ser. No. 869,007, May 30, 1986, abandoned. This application Sep. 7, 1988, Ser. No. 241,360

Claims priority, application United Kingdom, Jun. 6, 1986, 8514287

Int. Cl.[5] **B67B** *1/00, 3/00*; **B65G** *53/40*; **C25C** *3/00*

U.S. Cl. 222—1 **4 Claims**



1. A method of feeding particulate material by the use of apparatus comprising a passage having a floor, an upstream section for receiving the material and conveying it in a downward direction, and a downstream section for delivering the material, the two sections being connected by a chicane consisting of a horizontal or upwardly inclined section of the passage of sufficient length to cause the particulate material to come to rest therein in the absence of a flow of gas therethrough, a baffle system in the upstream section comprising at least two baffles mounted on opposite sides of the upstream section of the passage to cause the particulate material to follow a tortuous path round them to control the rate of flow of the material to the chicane, a pipe leading to a slot within the passage, the slot extending horizontally adjacent the floor of the passage and facing downstream near the upstream end of the chicane, which method comprises passing through the slot air compressed at a pressure below one meter of water gauge and starting and stopping the passage of air at predetermined intervals so as to start and stop the flow of the particulate material.

4,919,304

BUBBLER CYLINDER DEVICE

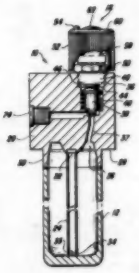
Marion Markowicz, Basking Ridge, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 761,470, Aug. 1, 1985, abandoned. This application Jun. 3, 1988, Ser. No. 202,166

Int. Cl.[5] **B67B** *7/24*

U.S. Cl. 222—3 **1 Claim**

1. A bubbler device for storage and delivery of electronic grade organometallic compounds, said device comprising a cylinder closed at its bottom and welded at its top rim to a cylindrical skirt member of a single block to form a container of which said block is the top closure portion, separate recesses in said block, each recess opening to an outer surface of said block and, within the first said recess, valve means for controlling inlet of gas into said container, and within another of said recesses valve means for controlling outlet of gas from inside said container, a first passage extending through said block from an inlet port at an outer surface of said block to said first recess and continuing from said first recess through the block to a first opening at the surface of the block inside said container, a second passage extending through said block from an outlet port at an outer surface of said block to said second recess and continuing from said second recess through the block to a second opening at the lower surface of the block inside said container, said second opening located within a recess of said lower surface such that said second opening is at



the highest point within said container, each of said valves in said first and second recesses being controllable from outside said block between open and closed positions for controlling flow of gas through said first and second passages respectively, each of said valves in its recess comprising a diaphragm which seals the recess between a valve stem outside said diaphragm and a valve plug inside said diaphragm in said recess, a dip tube inside said container fitted to said first opening in the block at the inner end of said first passage, said dip tube extending downward from said first opening to the bottom of said container and at least one slot or opening at or near the lower end of said dip tube for passage of gas from the dip tube into the container, the inner surfaces of said container and said dip tube being either electropolished or coated with a protective coating to provide a barrier to contamination of the contents by the metal of said container and dip tube.

4,919,305

FUEL DISPENSING NOZZLE WITH BUILT-IN FLOW REGULATOR

Alexander R. Podgers, Lake City, Pa., assignor to Emco Wheaton, Inc., Raleigh, N.C.

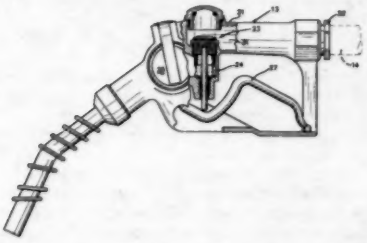
Continuation of Ser. No. 117,338, Nov. 6, 1987, abandoned. This application Apr. 4, 1989, Ser. No. 333,860

Int. Cl.[5] **B67D** *5/08, 5/16*

U.S. Cl. 222—55 **7 Claims**

1. A fuel nozzle comprising a housing having a passage therethrough from an inlet to a nozzle outlet, said passage providing a first passage portion defined by a cylindrical wall open to a lateral second passage portion, a lateral wall substantially perpendicular to said cylindrical wall and aligned therewith, an open-ended sleeve providing a cylindrical wall portion having port openings therein, a seal providing a fluidtight joint between said sleeve and said cylindrical wall of said first passage, one end of said sleeve being engageable with and closed by said lateral wall, a piston in said sleeve movable between a first position substantially clear of said port openings to operative positions in which it covers portions of said port openings and throttles flow of fuel therethrough, a spring

between said lateral wall and said piston resiliently urging said piston toward said first position, and an orifice through which fuel flows operating to produce a pressure differential across



said piston causing said piston to move against the force of said spring and limit the flow of fuel through said nozzle to a predetermined maximum flow rate.

4,919,306

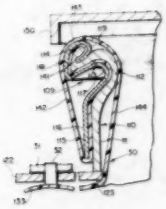
CONTAINER FOR FLUENT MATERIAL INCLUDING A RING-LIKE HOLDER FOR A BAG

Harry D. Heaps, Jr., and Charles E. Boy, both of Bala-Cynwyd, Pa., assignors to Connelly Containers, Inc., Bala-Cynwyd, Pa.

Continuation of Ser. No. 149,920, Jan. 25, 1988, abandoned, which is a continuation-in-part of Ser. No. 944,502, Dec. 17, 1986, Pat. No. 4,771,917. This application Mar. 31, 1989, Ser. No. 332,375

Int. Cl.[5] B65D *37/00*

U.S. Cl. 222—105 **38 Claims**



1. A container for non-gaseous fluent material to be transported therein comprising:

an outer wall, a bottom, a top on said outer wall,

a bag within said wall for holding non-gaseous fluent material, said bag having an upper portion including a mouth which defines a filling opening in the top of said bag, said bag having substantially the same size and shape as the interior of said container when said bag is filled with fluent material, and

means for supporting the mouth of said bag in open position for enabling filling of said bag with non-gaseous fluent material through said open mouth comprising:

a beam,

means for supporting said beam transversely of said container wall below the top of said container,

an opening in said beam,

said bag upper portion extending through said opening,

a ring-like holder independent of said beam on the top of said beam, said ring-like holder having an opening larger than said opening in said beam, and

means for securing the mouth portion of said bag to said holder without substantially reducing the size of the filling opening defined by said mouth of said bag and said opening of said ring-like holder.

4,919,307

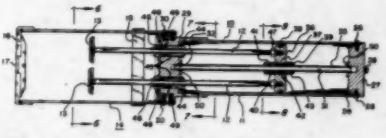
DUAL COMPONENT PNEUMATICALLY OPERATED CAULKING GUN

Franz K. Schneider, Jr., Moorestown, N.J., and Michael V. Haubert, Erdenheim, Pa., assignors to Albion Engineering Company, Philadelphia, Pa.

Filed Nov. 10, 1988, Ser. No. 269,581

Int. Cl.[5] B67D *5/46*

U.S. Cl. 222—137 **6 Claims**



1. In a dual component pneumatically operated caulking gun utilizing a pneumatic cylinder assembly having a pneumatic cylinder including a forward bulkhead, a rear bulkhead, a piston movable axially within the cylinder and dual piston rods carried by the piston extending through the forward bulkhead and terminating in ejector rams and a dual component cartridge assembly carried by the forward bulkhead assembly for supporting a pair of component cartridges in operable position with respect to the ejector rams, an improvement in the cylinder assembly permitting ease of piston movement and bidirectional power movement thereof comprising:

a hollow air transfer and piston guide tube having first and second ends disposed within the cylinder concentrically thereof extending through an aperture within the piston and secured at its first end by the forward bulkhead and at its second end by the rear bulkhead;

first air passage means communicating with the first end of the guide tube;

second air passage means communicating between the second end of the guide tube and the cylinder adjacent the rear bulkhead;

third air passage means communicating with the cylinder adjacent the forward, bulkhead; and

air valve means to selectively port a source of air pressure to the first and third air passage means to selectively move the piston and associated piston rods and ejector rams axially upon the piston guide tube in eject and retract directions.

4,919,308

HOT MELT DISPENSER

Gerald A. Majkrzak, Minneapolis, Minn., assignor to May Coating Technologies, Inc., St. Paul, Minn.

Continuation of Ser. No. 130,407, Dec. 9, 1987, abandoned. This application May 4, 1989, Ser. No. 351,326

Int. Cl.[5] B67D *5/62*

U.S. Cl. 222—146.5 **39 Claims**

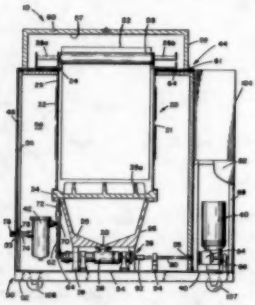
1. A hot melt dispenser for dispensing a solid, unitary mass slug of hot melt from a container wherein said slug adheres to the inside surfaces of said container in its unheated condition, said container open at one end to permit said slug to slide freely out of said container when said slug is released therefrom by the lowering of the adhesion of said slug to the sides of said container, said dispenser comprising:

a hopper sized to receive said container;

melting means located in the bottom of said hopper for melting hot melt to a liquified pumpable condition;

support means for supporting said container in said hopper with said open end down and positioned above said melting means with an unobstructed path from slug between said open end and said melting means so that said slug can slide freely out of said container and into contact with said melting means once said slug is released from said container;

means for pumping liquified hot melt from said hopper; and auxiliary heating means for heating the walls of said container when it is supported in said hopper by said support means, said heating means providing that said container is uniformly encircled with a heat sufficient to lower the adhesion of said slug to the inside surfaces of said container to cause said slug to be released from and slide out of said container as a solid unitary mass and into contact with said melting means and further to provide that at the time said slug is released from said container it retains nearly the same shape, dimensions and solid state it possessed in said unheated condition.

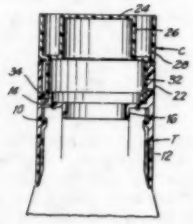


4,919,309

CAP FOR COLLAPSIBLE BOTTLES AND THE LIKE

Adriano G. Arona-Delonghi, Monterrey, Mexico, assignor to Fabricacion De Maquinas, S.A., Monterrey, Mexico

Filed Feb. 15, 1989, Ser. No. 311,471
Claims priority, application Mexico, Feb. 15, 1988, 10412
Int. Cl.[5] B65D 47/00
U.S. Cl. 222—153 **8 Claims**



1. A cap for collapsible bottles and the like comprising:

(a) a retention member body for coupling hermetrically to the mouth of the bottle,

(i) said retention member having at one end thereof a plurality of relatively flexible vertical fastening ribs which lock against the edge of the bottle's neck to prevent the cap from sliding upwardly and a plurality of vertical locking legs which hold the cap against the edge of the bottles's neck to prevent the cap from turning about the bottle;

(ii) said retention member having at its other end a detachable annular section disposed about its periphery to form at least one exit orifice when it is detached,

(iii) an annular wall connected to the internal part of the retention member body which serves as a seat on top of the mouth of the bottle,

(iv) a first retention wall attached to the internal part of the mouth of the bottle and disposed perpendicularly to said annular seating wall,

(v) a second retention wall disposed above said annular seating wall and extending perpendicularly and in a direction opposite to said first retention wall, and

(vi) said retention member body comprising a first locking means:

(b) a cover for insertion into said retention member, said cover including:

(i) a top wall for covering the exit orifice of the bottle,

(ii) at least one tubular wall attached to the top wall and disposed perpendicularly thereto,

(iii) an annular joining wall attached to the lower end of said tubular wall; and

(iv) a third retention wall located at the lower part of said annular joining wall, said third retention wall including second locking means which couple with the first locking means of the retention member body to prevent the removal of the cover from the retention member body, and having at least one exit orifice whereby when the cover is rotated in one direction the exit orifices of the retention member body and the third retention wall coincide to permit the passage of the bottle's contents and when the cover is rotated in the opposite direction the bottle is closed

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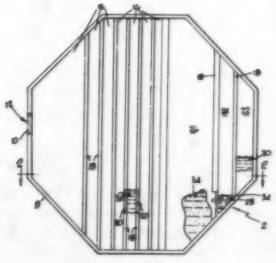
4,919,310

PRESSURE GENERATION SYSTEM FOR A CONTAINER

David C. Young, Westminster, and Mark A. Willcoxen, Lakewood, both of Colo., assignors to Adolph Coors Company, Golden, Colo.

Filed Mar. 2, 1989, Ser. No. 318,824
Int. Cl.[5] B67D 5/54
U.S. Cl. 222—386.5 **51 Claims**



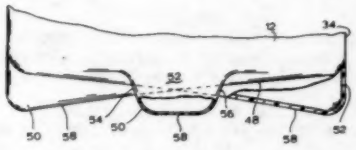
1. A self-generating gas pressure apparatus for placement within a container from which a flowable material in the container is to be dispensed under pressure exerted on the material by the gas pressure apparatus and wherein said gas pressure apparatus comprises a closed expandable vessel having a plurality of individual compartments formed by respective pressure-rupturable seal means therebetween, said compartments containing respective chemical compounds which when mixed upon the rupture of respective interfacing seal means produce a gas, and wherein at least two adjacent compartments respectively contain a first water-soluble chemical compound in aqueous solution and a second precipitated chemical compound dispersed in a water-dispersible suspension medium which, when said compounds are mixed upon the rupture of the seal means between said adjacent compartments, react with each other to produce a gas.

4,919,311

PRESSURE VESSEL FOR SPRAYERS

Gerald W. Born, Eldora, Iowa, assignor to Quality Products, Inc., Eldora, Iowa

Filed Apr. 10, 1984, Ser. No. 598,905
Int. Cl.[5] B65D *83/00*
U.S. Cl. 222—401 **11 Claims**



1. An all plastic, one-piece blow molded pressure vessel for a sprayer comprising in combination:

a substantially cylindrical side wall having a top and bottom;

a relatively reduced neck at and integral with the top of the side wall having pump coupling means for receiving a manually operated pump for pressuring the contents of the vessel;

an outwardly and upwardly flared funnel integral with the neck;

a hose coupling means near the top of the side wall for coupling with a hose for passage of the contents of the vessel under pressure;

a pressure relief valve coupling means for receiving a pressure relief valve for relieving pressure within the vessel that extends a predetermined value;

a bottom closure integral with the bottom of the side wall, the bottom closure being slightly dome-shaped to cooperate in resisting internal pressures, the bottom closure including a plurality of downwardly projecting and radially extending feet, each foot having a planar bottom face, spaced and opposed side faces and a circumferentially extending outer end face, each of the bottom faces being triangularly shaped meeting at a common location along the axis of the cylindrical wall, the bottom face being integral with the end face and extending from the end face radially inwardly and upwardly in a plane at a predetermined acute angle with a plane extending perpendicularly with the axis of the cylindrical side wall, whereby the feet cooperate in resisting internal pressures and in so doing are displaced so that the bottom face forms a smaller acute angle with the plane extending perpendicularly with the axis of the cylindrical side wall.

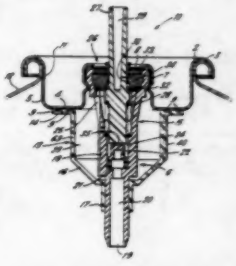
4,919,312

COLLAPSIBLE CHAMBER METERING VALVES

Walter C. Beard, Middlebury, Conn., and Michael D. Yallop, Norfolk, Great Britain, assignors to Bespak PLC, Norfolk, United Kingdom

PCT No. PCT/GB87/00062, § 371 Date Nov. 19, 1987, § 102(e) Date Nov. 19, 1987, PCT Pub. No. WO87/04685, PCT Pub. Date Aug. 13, 1987
PCT Filed Jan. 29, 1987, Ser. No. 112,604
Int. Cl.[5] B65D *83/14*; G01F *11/00*
U.S. Cl. 222—402.2 **6 Claims**

1. Dispensing apparatus (10) for use in a pressurized dispensing container and comprising a mounting cup member peripherally securable to the container, a valve mounted in the cup member such that at least a valve stem of the valve extends through an aperture defined by the cup member, which valve includes collapsible chamber means comprising an elastomeric vessel for metering a predetermined volume of fluid to be dispensed, inlet valve means admitting pressurized fluid to the chamber from the container when the valve is in a closed condition and outlet valve means releasing fluid from the chamber through the valve stem when the valve is in an open condition to thereby dispense the predetermined volume of fluid, wherein the mounting cup member includes a thermoplastic layer attached to its interior surface with respect to the container, the collapsible chamber means includes an annular bonding portion of a plastics material which is thermally



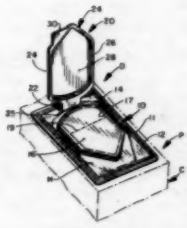
bonded to the thermoplastic layer, and wherein the annular bonding portion of the collapsible chamber means comprises a retaining ring having means for gripping an integrally formed flange of the elastomeric vessel in sealing contact with the mounting cup.

4,919,313

CARTON POURING DEVICE

Patrick J. O'Brien, Hackensack, N.J., assignor to Container Corporation of America, Clayton, Mo.

Filed Dec. 8, 1988, Ser. No. 281,272
Int. Cl.[5] B65D *47/10*
U.S. Cl. 222—541 **2 Claims**



2. A unitary, molded plastic, reclosable, pouring device adapted to be secured to an outer wall of a paperboard carton, adjacent an opening in said carton wall, to provide a tamper evident dispensing package for particulate type materials, said device comprising:

(a) a base member including:

(i) a relatively thin plate adapted to be positioned entirely within a carton and having an outer surface adhesively secured to an inner surface of said carton wall and having extending therethrough a dispensing opening that is alignable with an opening in said carton wall;

(ii) an integral closure flange projecting from said plate adjacent the periphery of said dispensing opening and adapted to extend out of said carton wall opening;

(iii) an integral sealing membrane detachably secured to to said flange within said dispensing opening and including a pair of sections hingedly connected to each other to facilitate removal of said membrane from said base member upon initial opening of said package;

(b) said cover member including:

(i) a relatively thin flat rim portion hingedly connected to

said base member plate and adapted to overlie said plate;

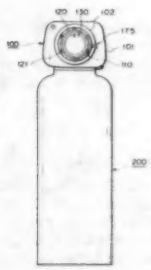
(ii) an integral center portion extending outwardly from said rim portion and forming a dome-like structure operable to engage said base member sealing flange and provide a relatively tight fit therebetween upon reclosure.

4,919,314

TIME CONTROL DEVICE FOR WATER CONDITIONING APPARATUS

Masanobu Nishiyama, Ehime; Hitoshi Abe, and Yasuo Ochi, both of Matsuyama, all of Japan, assignors to Miura Co., Ltd, Matsuyama, Japan

Filed Sep. 6, 1988, Ser. No. 240,949
Claims priority, application Japan, Sep. 7, 1987, 62-224433
Int. Cl.[5] G04C 5/08
U.S. Cl. 222—643 **18 Claims**



1. A time control device for a water conditioning apparatus, said time control device periodically changing flow conditions of a liquid in said apparatus, said time control device comprising:

a housing connected to a treatment container,

means for controlling a flow of said liquid in said water conditioning apparatus, wherein said control means has a bore formed in said housing and a main piston slidably supported in said bore, said housing being formed with an inlet port for introducing said liquid into said treatment container, an outlet port for discharging treated liquid, a first connecting port communicating with said treatment container, a second connecting port communicating with said treatment container, and a drain discharge port for discharging treated liquid outside said water conditioning apparatus, said bore being connected to said inlet port, said outlet port, said first connecting port, said second connecting port, and said discharge port, said piston moving in said bore to open and close said each port, wherein said outlet port, said inlet port, said first connecting port, said drain discharge port, and said second connecting port are located from the top side of said housing to the bottom side of said housing, and said piston moves in a predetermined direction so that the regeneration operation is carried out,

a main shaft rotatably supported by said housing, said main shaft having a mechanism for driving said control means in accordance with a rotation of said main shaft,

a main wheel rotatably supported about the axis of said main shaft,

means for rotating said main shaft and said main wheel, said rotating means constantly rotating said main wheel at a predetermined speed, and rotating said main shaft to perform a treatment,

a skipper wheel rotatably supported about the axis of said main shaft,

means for engaging said main wheel with said skipper wheel to rotate said skipper wheel through a predetermined angle,

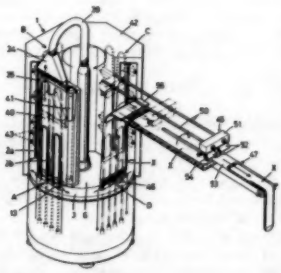
means for transmitting said predetermined angular rotation of said skipper wheel to said main shaft, so that said main shaft is rotated directly by said rotating means, whereby a treatment by and of said liquid is carried out.

4,919,315

APPARATUS FOR FINISHING PANTYHOSE

Makoto Nakano, Yamatotakada, Japan, assignor to Takatori Corporation and Takatori Hitech C., Ltd., both of Nara, Japan

Filed Mar. 30, 1989, Ser. No. 334,885
Claims priority, application Japan, Mar. 31, 1988, 63-81115
Int. Cl.[5] D06C 5/00
U.S. Cl. 223—76 **7 Claims**



1. An apparatus for finishing pantyhose comprising:

a ring-shaped plate rotatably mounted in the apparatus;

a plurality of spaced-apart and vertically movable pairs of pattern frames mounted to said ring-shaped plate so as to be rotatable therewith in the apparatus, each of the frames of said pairs of pattern frames comprising a metal rod having a pair of leg portions extending in an inverted U-shape and adapted to receive a respective hose portion of a pair of pantyhose thereon wherein each of said pairs of frames is adapted to receive thereon a respective pair of pantyhose;

drive means operatively connected to said ring-shaped plate for rotating said plate in the apparatus and stopping the ring-shaped plate intermittently at predetermined angular intervals to progressively locate said pairs of frames rotating with said ring-shaped plate at positions defining an inspection station, a drying station and a pulling-out station in the apparatus;

elevating means engageable with said pairs of frames at the inspection station for moving said pairs of frames when at the inspection station vertically upward in the apparatus;

spreading means operatively connected to said pairs of pattern frames at the inspection station for spreading the leg portions of the frames at the inspection station;

an infrared heater disposed at the drying station for subjecting pantyhose supported on the pairs of frames at the drying station to infrared radiation;

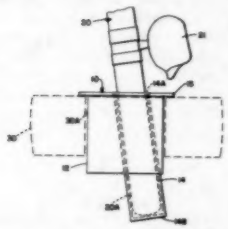
lowering means engageable with said pairs of frames at the pulling-out station for moving said pairs of frames at the pulling-out station vertically downward in the apparatus; and

clamping means at said pulling-out station for clamping the toe portion of pantyhose on the pairs of pattern frames at the pulling-out station prior to the pairs of frames being lowered by said lowering means.

4,919,316
FISHING ROD HOLDER

Gerald D. Grauberger, Rte. 4, 13811 Beal Rd., Sterling, Colo. 80751

Filed Dec. 20, 1988, Ser. No. 287,098
Int. Cl.[5] B60R 9/08; A01K 97/10
U.S. Cl. 224—42.42 12 Claims



1. A fishing rod holder for removable insertion into an existing opening in a boat for the purpose of receiving and supporting the handle end of a fishing rod, said fishing rod holder comprising,

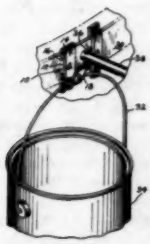
(a) a tubular cylindrical body member having upper and lower ends, wherein said upper end includes an outwardly projecting flange; wherein said tubular body member is circular in cross-section;

(b) a hollow tubular receiver non-movably secured within said body member, said receiver having upper and lower ends positioned adjacent the upper and lower ends of said body member, respectively, wherein said tubular receiver is sized to enable said handle end of said fishing rod to be slidingly inserted therein; wherein said tubular receiver has a circular cross-section and is tilted at an angle with respect to the longitudinal axis of said body member.

4,919,317
UTILITY BELT HOOK

Gary D. Luedtke, 2226 N. 64th St., Wauwatosa, Wis. 53213

Filed Mar. 29, 1988, Ser. No. 174,594
Int. Cl.[5] A45F 5/00; A46B 17/00; B05C 21/00; B25F 1/00
U.S. Cl. 224—151 8 Claims



1. A utility hook for a painter or the like, comprising:

a clip adapted for attachment to a belt or the like, said clip including first and second downwardly extending members connected together toward their upper ends, said first and second downwardly extending members defining a belt-receiving space therebetween;

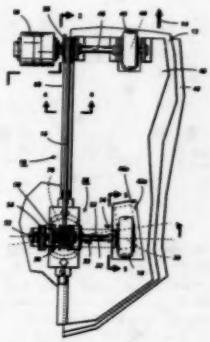
an upwardly extending member connected to said second downwardly extending member and defining a bail-receiving area therebetween, said bail-receiving area being adapted to receive the bail of a paint bucket or the like, said upwardly extending member being provided with receiving means for receiving and retaining a paint brush or the like thereon; and

claw means for use in pulling nails or the like, said claw means comprising a substantially V-shaped slot provided at the lower end of said first downwardly extending member.

4,919,318
SWING ARM ROLLER SPEED DIFFERENTIAL WEB TRACKING SYSTEM

Lam F. Wong, Walworth, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 18, 1988, Ser. No. 182,620
Int. Cl.[5] B65H 23/038, 23/00
U.S. Cl. 226—17 1 Claim



1. In a system for side registration of an elongated delicate or flimsy web sheet by driving the web sideways (transversely) in the sheet path against a side registration edge guide, while the web is being driven downstream in its primary direction of movement, by a frictional roller drive system, the improvement comprising:

downstream fixed nip roller drive means for engaging and driving the web in said primary direction of movement, at a first driving nip velocity;

upstream pivotal nip drive roller means mounted on a pivotal arm unit to simultaneously continously engage and drive the same web upstream of said downstream fixed nip roller drive means;

means for driving said upstream pivotal nip drive roller means at a second driving nip velocity which is slightly less than said first driving nip velocity of said downstream fixed nip roller drive means by a ratio of said first and second driving velocities between approximately 1.002 and 1.015;

said pivotal nip drive roller means automatically pivoting with said pivotal arm unit into an equilibrium nip position at a small, variable, angle to said side registration edge guide, with a resultant slip velocity frictional force pulling the web towards said side registration edge guide which is proportional to said equilibrium angle, which is proportional to and resulting from said slight difference between said first and second driving nip velocities, to deskew the web by driving the web sideways (transversely of) the web path against said side registration edge guide;

wherein said web sheet is a computer form web;

wherein said upstream pivotal nip drive roller means comprises a constantly mating nip of two parallel axis rollers, mounted to said pivotal arm unit to pivot therewith, which rollers do not slip relative to one another;

and wherein said pivotal arm unit is freely pivotable in a

preset maximum range of pivotal movement limited to approximately 10 degrees, said limited range of pivotal movement being defined by limit means positioned to impede pivoting of said arm unit outside of said limited range.

4,919,319

CONTACTLESS WEB SUPPORT GUIDE

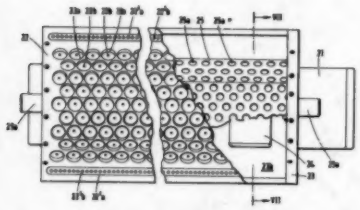
John W. Ford, 54 Chesham Rd., Kingston Upon Thames, Surrey, England (KT1 3AQ), and Maurice J. Dyer, 3 Sylvan Ave., Mill Hill, London, England (N.W. 7)

Continuation-in-part of Ser. No. 58,279, Jun. 4, 1987, Pat. No. 4,824,002. This application Mar. 22, 1989, Ser. No. 327,139

Claims priority, application United Kingdom, Jun. 6, 1986, 8613764; May 1, 1987, 8710433; May 25, 1988, 8807170

Int. Cl.[5] B65H *23/24*

U.S. Cl. 226—197 9 Claims



1. A contactless support guide for guiding a moving web of material; said guide comprising means defining an arcuate support face for controlling the moving web; a multiplicity of first pockets in the support face, the first pockets being distributed over the support face to substantially fill the face; apertures in said first pockets for emitting air; further elongate pockets provided in the support face at marginal regions where the web enters and exits the guide; a plurality of closely spaced apertures in each of the further pockets for emitting air; and air supply means, including a manifold, for receiving pressurized air and for supplying said air to the apertures of the first and further pockets to create an air cushion extending around the support face to support the moving web in a generally uniform spaced relationship relative to the support face; wherein the further pockets are angled towards the first pockets and the apertures in the further pockets are larger than the apertures in the first pockets to produce zones of higher pressure in the air cushion at said marginal regions where the web enters and exits the guide.

4,919,320

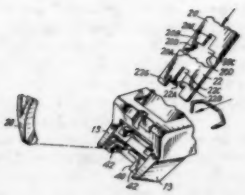
SURGICAL STAPLER

Anthony Storace, Norwalk, Conn., assignor to Technalytics, Inc., Montvale, N.J.

Filed Mar. 7, 1988, Ser. No. 164,818

Int. Cl.[5] A61B *17/00*

U.S. Cl. 227—19 12 Claims



1. In a surgical stapler which includes a housing, an anvil having a transverse lip for receiving the crossarm of a staple and carrying said staple along a delivery path, a former for driving said anvil and staple in a downstroke from an initial rest position, and spring means for biasing said anvil and former in an upstroke toward their respective rest positions, said staple being bent to a closed state about the anvil lip during said downstroke, the improvement in combination therewith of a stripper means for stripping the closed staple off the anvil lip during the upstroke of the former and anvil, said stripper means comprising a projection from said housing having an end part with a lower cam surface thereon, in operation of said stapler said stripper means being positioned such that after the downstroke said end part has its lower cam surface above the crossarm of the closed staple on the anvil lip, and during said upstroke said anvil lip urges said crossarm against said lower cam surface which surface drives said staple transversely off said anvil lip.

4,919,321

ARRANGEMENT FOR RIVETING

Sven-Olof Rydström, Sturefors, and Mikael Johansson, Linkoping, both of Sweden, assignors to Saab-Scania AB, Linkoping, Sweden

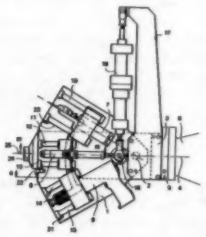
PCT No. PCT/SE87/00465, § 371 Date Apr. 5, 1989, § 102(e) Date Apr. 5, 1989, PCT Pub. No. WO88/02673, PCT Pub. Date Apr. 21, 1988

PCT Filed Oct. 14, 1987, Ser. No. 340,729

Claims priority, application Sweden, Oct. 15, 1986, 86043619

Int. Cl.[5] B27F *7/02*

U.S. Cl. 227—69 7 Claims



1. A riveting device for riveting sheet material and especially for riveting of material with a complex shape, comprising drilling means, rivet positioning means, means for repetitive striking movement and bucking bar means, characterized in that said drilling means (7), rivet positioning means (8) and striking movement means (9) are disposed for one at a time movement into the same operating position in relation to frame means (3), said frame means being carried by a first positioning robot means moveable in multiple directions in relation to said sheet material (33), on one side thereof, in conjunction with said bucking bar means (28) wherein said bucking bar means is carried by a second positioning robot means (32) moveable in multiple directions in relation to said sheet material (33), on the other side thereof from said striking means (9) so as to interact with said striking means during the riveting operation.

4,919,322

DESOLDERING TIP AND REPLACEMENT APPARATUS

William S. Fortune, 29866 Cuthbert Rd., Malibu, Calif. 90265, and Robert E. Dallons, 6625 Tamarind, Agoura, Calif. 91301

Filed Mar. 6, 1989, Ser. No. 320,085

Int. Cl.[5] B23K *3/00*

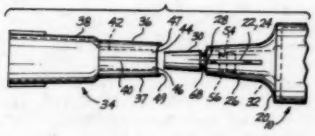
U.S. Cl. 228—20 6 Claims

1. A desoldering system comprising:

A. a desoldering implement of the character having a

molded plastic body having an elongated cylindrical barrel housing a spring actuated vacuum producing piston and having molded therewith a front end cap including a forwardly protruding cylindrical nose portion formed with a central, axially aligned nozzle retaining bore therethrough of a predetermined first diameter, said nose portion having an annular retaining shoulder formed in said bore and extending radially inwardly from said first diameter to a lesser second diameter and being axially spaced rearwardly of the front end of said nose portion, said nose portion also including at least one levering fin extending radially outwardly from the outer diameter of said nose portion and extending rearwardly from the front end of said nose portion along at least a portion of the length thereof;

B. a replaceable plastic nozzle of the character to be carried by said nose portion and extend forwardly therefrom for solder removing contact with a workpiece, said nozzle being tubular with an outer diameter in its central portion approximately equal to said first diameter and having an annular retention groove formed near its rear end, the inner diameter of the groove being approximately equal to said second diameter, and the axial lengths of said groove and said retaining shoulder being approximately equal, the outer diameter of the nozzle being tapered inwardly from a point just rearwardly of said groove to a reduced diameter, approximately equal to or less than said second diameter, at the rear of said nozzle, said nozzle further including a second annular groove formed about the circumference thereof at a point axially contiguous to and forwardly of said front end of said nose portion when said retaining shoulder and first annular groove are retentively engaged; and



C. a nozzle removal tool having

1. a hollow molded plastic body,
2. a pair of flexible juxtaposed jaws carried by said body and extending away therefrom along a predetermined axis, said jaws being internally relieved to receive between them along said axis the forward portion of said replaceable nozzle, said jaws further each including an inwardly protruding gripping tab near its end and being of the character to grip said nozzle by being inserted into said second annular groove when the nozzle is received between said jaws, said jaws further having cam surfaces forming their outer ends and diverging away from said axis in a manner such that when said nozzle installed in said nose portion is received between said jaws and gripped by said gripping tabs, the front end of said levering fin engages a said cam surface and is forced away from said body of said removal tool when it is rotated, about said axis, with respect to said body, and
3. release means carried by said body for guiding said levering fin between said jaws to separate them and cause the release thereby of said nozzle.

4,919,323

DIFFUSION BONDING NICKEL BASE ALLOYS

Murray W. Mahoney, Camerillo, and Leslie M. Holmes, Jr., Simi Valley, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 5, 1989, Ser. No. 361,616
Int. Cl.[5] B23K *20/02, 20/16, 20/22, 20/24*
U.S. Cl. 228—157 **12 Claims**

1. A method for diffusion bonding sheets of nickel base alloy comprising the steps of:

providing a foil of type 300 series stainless steel;

providing a screen of type 300 series stainless steel;

providing sheets of a nickel base alloy;

placing the foil and the screen between the sheets in the area to be bonded;

heating the sheets and intervening foil and screen to a temperature below which rapid grain growth occurs in the sheet; and

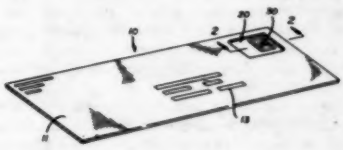
deforming the screen to create continuous contact between the surfaces to be bonded.

4,919,324

ENVELOPE

Dwight E. Hottle, 2866 Lakeland Pkwy., Stow, Ohio 44224

Filed Dec. 27, 1988, Ser. No. 289,777
Int. Cl.[5] B65D *27/00*
U.S. Cl. 229—68 R **2 Claims**



1. An envelope, comprising an imperforate forward indicia receiving surface having a recessed postage receiving area formed therein; said postage receiving area including a generally rectangular perimeter wall extending inwardly from said imperforate indicia receiving surface and a bottom wall integral with said perimeter wall.

4,919,325

COMBINATION WINDOW ENVELOPE AND INSERT AND METHOD OF USING SAME

William P. Culver, P.O. Box 2236, Rancho Sante Fe, Calif. 92067

Filed Sep. 14, 1988, Ser. No. 244,816
Int. Cl.[5] B65D *27/04*
U.S. Cl. 229—71 **21 Claims**

1. An envelope system comprising:

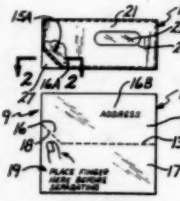
a document member having a document separation tear line of perforations extending from its right side edge to its left side edge, said tear line of perforations dividing said document member into a top and bottom portion, wherein at least one of said top and bottom portions is an envelope insert member;

a substantially rectangular envelope having a front and back panel connected in facing relation along their lower, left and right edges; said front and back panels forming a closable opening to the interior of said envelope;

said opening being closable by an integral flap extending from the top edge of the front panel, said flap having sealing means for securing said flap to the exterior surface of said back panel;

said front panel having an opening therein defining a window for permitting at least one surface of said insert member to be viewed when said insert member is disposed within the interior of said envelope;

securing means disposed within the interior of said envelope and extending diagonally between a side edge and the bottom edge thereof for binding together a portion of the interior of said front and back panels of said envelope;



said portion defining a stop within the interior of said envelope and defining an interior envelope insert member receiving space, said space being substantially the same size as said envelope insert member;

said document member having a manually removable portion, said removable portion being defined by a tear line of perforations intersecting at least one edge of said document for enabling a user to form a stop engageable portion of said envelope insert member, said stop engageable portion being complementary shaped relative to said removable portion; and

said stop engageable portion being disposed on said envelope insert member in a similar orientation as the position of said stop member to permit said stop engageable portion to be positioned adjacent to said stop when said envelope insert member is disposed within the interior of said envelope to help cause the proper orientation of the insert member relative to the envelope window.

4,919,326

CONTAINER WITH IMPROVED RETENTION PROPERTIES AND IMPROVED CORNER STRUCTURES

Anthony J. Deiger, 2761 Riva Ridge Rd., Toledo, Ohio 43615

Filed Feb. 10, 1989, Ser. No. 310,108

Int. Cl.[5] B65D *5/56*

U.S. Cl. 229—109 **25 Claims**

1. A shallow container for hot food products such as pizza pies, said container comprising

a bottom panel having an inside surface and an outside surface,

a top panel having an inside and an outside surface,

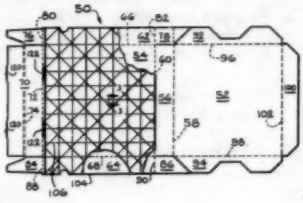
a rear wall hingedly connecting said top and bottom panels,

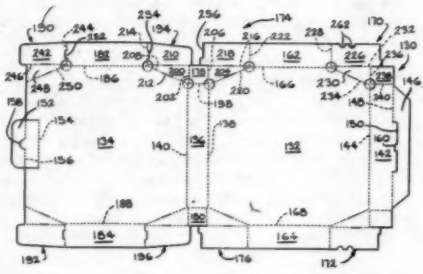
two opposed walls having inside and outside surfaces, said side walls being connected to said top or bottom panel,

a front wall connected to said top or bottom panel,

a sheet of insulative, foamed polymeric material having first and second opposed major surfaces, said first major surface being bonded to and covering substantially all of the inside surface of said bottom panel, in face-to-face relationship therewith, said inside surface of said top panel being substantially free of insulative, foamed polymeric material, and

means provided in said second opposed major surface of said sheet of insulative, foamed polymeric material for releasing moist air from between said second opposed major





surface of said sheet of insulative, foamed polymeric material and a hot food product carried thereon.

4,919,327

AIR-PROCESSING INSTALLATION DESIGNED FOR THE VENTILATION AND AIR-CONDITIONING OF SEVERAL ROOMS AND AIR-PROCESSING MODULE DESIGNED FOR AN INSTALLATION OF THIS TYPE

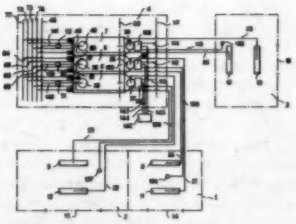
Patrice Elluin, Paris; Pascal Verrecchia, Les Lilas; Georges Mauer, Evreux, and Philippe Cardon, La Boissiere-Ecole, all of France, assignors to Societe D'Administration Et De Realisations D'Investissements (SARI), Paris, France

Filed Jul. 7, 1988, Ser. No. 216,301

Claims priority, application France, Jul. 10, 1987, 87 09630

Int. Cl.[5] F24F *7/00*

U.S. Cl. 236—49.1 **92 Claims**



1. An air-processing installation designed for the ventilation and air-conditioning of several rooms, and comprising, to this effect, air-processing means housed in an engine room, at least one air blowing opening and at least one air suction opening in each room and conduits to connect said air blowing and air suction openings to the air-processing means.

wherein said air processing means comprises several air processing modules grouped together in said engine room and wherein said air suction and air blower conduits connect each module with a respective room independently of the other rooms and other air-processing modules:

an air suction connector connected by a respective conduit to the air suction opening of the respectively associated room,

an air blowing connector connected to the air blowing opening of the respectively associated room by a respective conduit,

an internal air circuit within each module connecting said air suction and air blowing connectors to each other,

ventilation and air-conditioning means interposed in each said internal air circuit within each module,

means for connecting the ventilation and air-conditioning means within each module to energy supply means,

adjustable means to regulate the ventilation and air-conditioning means within each module at least as regards air temperature within a respective room,

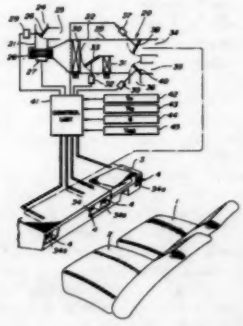
and wherein there are provided respective means for the remote control of adjustable means for the regulation of the ventilation and air-conditioning means of each air-processing module from the respectively associated room.

4,919,328

AUTOMOBILE AIR CONDITIONING SYSTEM

Junichiro Hara; Yoshiyuki Ogihara, both of Yokohama, and Akira Mochizuki, Kanagawa, all of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Mar. 14, 1989, Ser. No. 322,989
Claims priority, application Japan, Mar. 22, 1988, 63-67620
Int. Cl.[5] F24F *7/00*
U.S. Cl. 236—49.3 **8 Claims**



1. An automotive air conditioning system including a duct through which conditioned air is directed into a compartment for passengers comprising:

a control device associated with the duct for operating in a first mode discharging the conditioned air in the form of concentrated currents toward the passengers, in a second mode discharging the conditioned air in the form of diffused currents toward the passengers, and in a third mode in which switching is performed between the first and second modes at variable time intervals;

means sensitive to a temperature in the passenger compartment for producing a first sensor signal indicative of the sensed compartment temperature;

means sensitive to the intensity of insolation in the compartment for producing a second sensor signal indicative of the sensed insolation intensity; and

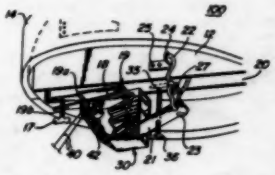
a control unit responsive to the first and second sensor signals for operating the control device in one of the first, second and third modes, the control unit including means for operating the control device in the third mode when the sensed compartment temperature is less than a reference value and when the sensed insolation intensity exceeds a reference value.

4,919,329

THERMALLY ACTIVATED AUTOMATIC DAMPER AND DAMPER OPERATOR

Francis J. McCabe, 239 Hastings Ct., Doylestown, Pa. 18901

Filed Apr. 24, 1989, Ser. No. 342,496
Int. Cl.[5] G05D *23/08*
U.S. Cl. 236—93 R **6 Claims**



1. For a damper having a frame and at least one reciprocal blade operatively associated therewith, an improved damper operator comprising:

a bimetallic element having a temperature movement response;

means for coupling the blade to the bimetallic element so that the temperature movement response of the bimetallic element causes the blade to move; and,

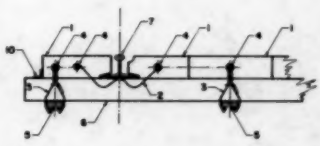
rotatably moveable hinge means for coupling the bimetallic element to the frame for biasing the bimetallic element to adjust the temperature movement response.

4,919,330

QUICK RELEASE RAILROAD HIGHWAY CROSSING

Winger, James W., 5728 E. Glen Clara Dr., Huntington, W. Va. 25705

Filed Mar. 3, 1989, Ser. No. 318,558
Int. Cl.[5] E01B *21/04*
U.S. Cl. 238—8 **5 Claims**



1. A railroad highway crossing panel fastening system in combination with a track assembly that includes parallel rails supported by cross-ties positioned transversely under said rails, elongated hanger bars positioned transversely below the cross-ties and highway crossing panels positioned on top of the cross-ties in a manner to establish a substantially continuous horizontal surface at substantially the level of the upper-most surface of the rails in an installed position, said crossing panels being secured on top of the cross-ties by said highway crossing panel fastening system, which fastening system includes:

at least one substantially W-shaped spring clip having one end pivotally connected to a first pin on one of said crossing panel, the opposite end hooked to a second pin on one of said crossing panel by means of a hook formed on said opposite end, and a mid-section between said ends and traversing underneath an associate rail;

a hanger having an upper end portion pivotally connected to a third pin on one of the crossing panels and a lower end

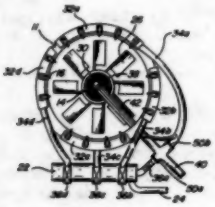
portion hooked onto one of said hanger bars by hook means formed at said lower end portion of the hanger.

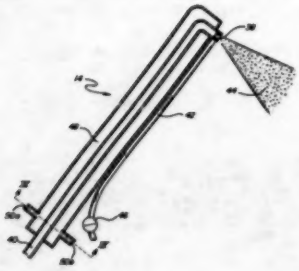
4,919,331

SNOW MAKING APPARATUS AND METHOD FOR MAKING SNOW

Joseph F. Kosik, Sr., Rochester, and Bruce M. Firestone, Grand Blanc, both of Mich., assignors to Mt. Holly, Inc., Holly, Mich.

Continuation of Ser. No. 74,547, Jul. 17, 1987, Pat. No. 4,813,598. This application Mar. 14, 1989, Ser. No. 323,303
The portion of the term of this patent subsequent to Mar. 21, 2006, has been disclaimed.
Int. Cl.[5] A01G *15/00*
U.S. Cl. 239—2.2 **12 Claims**





10. A method of making snow, said method comprising:

providing a blower adapted to provide a high volume stream of air;

providing a nucleator, said nucleator adapted to discharge a high pressure flow of air in a direction parallel to the stream of air, and a water inlet adapted to impinge a stream of water into said high pressure flow of air so as to produce a spray of ice crystals;

disposing said nucleator proximate the center of the high volume stream of air, so that said spray of crystals is initially projected into central portions of the stream of air; and

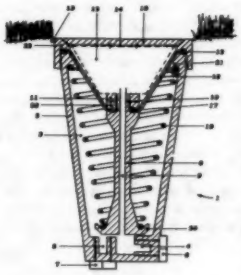
injecting a spray of water into the air stream from a nozzle oriented so as to initially inject said spray of water into the periphery of the air stream, so that said spray of ice crystals initially contacts the spray of water at a point at least ten feet from the nucleator so as to initiate freezing thereof.

4,919,332

RISER OR POP-UP IRRIGATION SPRINKLER

James L. Bailey, P.O. Box 119, Collaroy Beach, NSW 2097, Australia, assignor to James L. Bailey, Collaroy Beach, Australia

Filed Mar. 1, 1988, Ser. No. 162,735
Claims priority, application Australia, Mar. 2, 1987, 69837
Int. Cl.[5] B05B *15/10*
U.S. Cl. 239—205 **2 Claims**



1. A retractable sprinkler comprising a housing defining an internal cavity provided with a fluid inlet for admittng fluid to said internal cavity, a riser positioned within said cavity and spaced inwardly from said housing and defining a passage therethrough and terminating in a nozzle at an upper end thereof, a flexible diaphragm sealingly connected between an upper end of said housing and said riser contiguous to said nozzle and supporting the upper end of said riser, a coil compression spring engaged between an outwardly extending lip provided at a lower end of said riser and an inwardly extending lip integrally formed at an upper end of said housing and supporting said lower end, the outer housing being configured with an integrally formed wall at the upper end, said wall forming an opening means sized and shaped to pass said riser with said coil spring attached when said coil spring is compressed and said riser and said compressed coil spring are inserted in a generally horizontally extending position through said opening means into the cavity for rotation within said housing cavity into a generally vertically extending operative position, when rotated into a generally vertically extending position and released, said coil spring engages the underside of said upper wall for maintaining said riser in a retracted position within said housing and, upon the introduction of fluid through said fluid inlet, said coil spring yields to permit said riser to move outwardly of said housing against the compressive action of said coil spring for flow of fluid through said passage for dissipation from said nozzle.

4,919,333

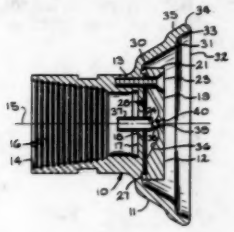
ROTARY PAINT ATOMIZING DEVICE

Richard Weinstein, Toledo, Ohio, assignor to The DeVilbiss Company, Toledo, Ohio

Continuation-in-part of Ser. No. 879,082, Jun. 26, 1986. This application Nov. 15, 1988, Ser. No. 271,523
Int. Cl.[5] B05B *3/10*
U.S. Cl. 239—223 **24 Claims**

23. An improved rotary paint atomizer device comprising a bell adapted to be rotated about an axis at high speeds, said bell having a front side defining an interior wall connecting with an interior generally conical surface, said conical surface extending symmetrical about said axis to a forward paint discharge edge, a paint receiving chamber located on said axis, said chamber having a forward surface rotated with said bell, a stationary axial paint feed tube having a forwardly directed discharge end located in said chamber on said axis, said tube

directing paint along said axis at said forward surface, means for feeding paint from said chamber onto said conical bell surface, and a plurality of small straight passages extending



from said forward chamber surface at a location spaced from said axis to said interior wall to deliver a limited portion of the paint delivered to said chamber to flow across said interior wall and said conical surface to said discharge edge.

4,919,334

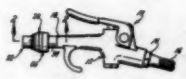
BLOW GUN ASSEMBLY

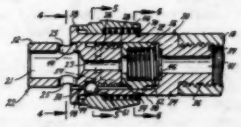
Leonard J. Hartmann, St. Louis, and Michael E. Weller, House Springs, both of Mo., assignors to Dynaquip Controls Corporation, Fenton, Mo.

Filed Jan. 19, 1989, Ser. No. 300,084

Int. Cl.[5] B05B *15/06*

U.S. Cl. 239—600 **10 Claims**





1. An air gun assembly having a quick-change nozzle system, comprising:

(a) an air gun including an inlet connectible to an air supply and an outlet selectively delivering a stream of pressurized air,

(b) a nozzle having an inlet and an outlet for directing the air stream, and

(c) a quick-change coupling adaptor including means at one end connectible to the outlet of the air gun and means at the other end adapted to receive the nozzle in quick-change relation,

(d) the nozzle including latch-engaging means,

(e) the adaptor including:

1. a body having a socket defining an open end receiving the nozzle in sliding relation,
2. latch means carried by the body in spaced relation from said open end,
3. a plunger slidably mounted in the socket and including means biasing said plunger outwardly toward said open end, said plunger being engageable by said latch means to limit outward movement of said plunger and being engageable by said nozzle to move said plunger inwardly out of engagement with said latch means when said nozzle is inserted within said body socket, and
4. a sleeve slidably mounted on the body and including means biasing said sleeve toward said socket open end, said sleeve being engageable with said latch means to urge said latch means into engagement with said nozzle latch-engaging means when said sleeve is in one position and said sleeve retaining said latch means when said latch means moves out of engagement with said nozzle latch-engaging means when said sleeve is in another position.

4,919,335

METHOD AND APPARATUS FOR ATOMIZATION AND SPRAYING OF MOLTEN METALS

David O. Hobson; Igor Alexeff, both of Oak Ridge, and Vinod K. Sikka, Clinton, all of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 19, 1988, Ser. No. 221,393

Int. Cl.[5] B05B *5/06, 7/18*

U.S. Cl. 239—3 **7 Claims**

1. A method for producing a directed spray of fine particulate molten metal comprising:

providing spaced apart electrodes defining an open-ended zone therebetween for receiving molten metal feed;

providing a flow of molten metal feed into said zone in contact with said electrodes, thereby creating a flow path for electric current between said electrodes;

providing a magnetic field through said zone in a direction perpendicular to said flow path for electric current through said zone; and

passing an electric current through said electrodes and said molten metal in said zone to create magnethydrodynamic forces which accelerate said molten metal within said zone in a direction perpendicular to said flow path and said magnetic field thereby causing said molten metal feed to exit said zone and disperse into fine particulate droplets; the directions of said magnetic field and electric current being selected to provide the desired direction of acceleration of said molten metal feed.

4,919,336

SHOWER PIPES

James D. Hudon, Beaconsfield, and Lionel T. Bloyce, Maidenhead, both of England, assignors to Albany International Corp., Menands, N.Y.

Filed Jul. 10, 1987, Ser. No. 73,750

Claims priority, application United Kingdom, Jul. 14, 1986, 8617100

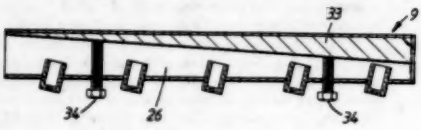
Int. Cl.[5] D21F *1/42*

U.S. Cl. 239—11 **13 Claims**

1. In a papermaking machine, a shower apparatus comprising:

at least one shower pipe formed from a hollow member, the pipe being restricted at one end, the other end being arranged for connection to a liquid supply, a liquid supply passageway extending, within the pipe, from said other end to the said one end, and having a passageway cross-

sectional area and a plurality of liquid discharge nozzles along the length of the pipe for discharging liquid flow along the passageway,



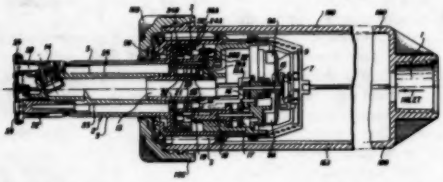
said passageway cross-sectional area decreasing toward said one end of the said pipe for increasing the minimum liquid velocity within the passageway sufficiently to substantially prevent separation of solids from the liquid within the passageway.

4,919,337

ARC ADJUSTMENT FOR IRRIGATION SPRINKLER

Timothy O. Van Leeuwen, and Billy J. Hobbs, Jr., both of Gardnerville, Nev., assignors to GardenAmerica Corporation, Carson City, Nev.

Filed Apr. 10, 1989, Ser. No. 339,283
Int. Cl.[5] B05B *3/16, 3/04*
U.S. Cl. 239—205 **10 Claims**



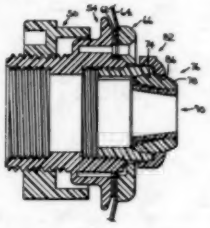
1. In a sprinkler head comprising a tubular housing having an inlet at one end, an internal assembly rotatably mounted in said housing for discharging water over a sector of land to be irrigated in response to water introduced under pressure into the housing through the inlet, said internal assembly including inner and outer tubular members rotatably mounted in said tubular housing in coaxial relationship therewith and with one another; a drive member movable between first and second positions to engage one or the other of said inner and outer tubular members to cause said internal assembly to turn in opposite directions in said housing, a reversing assembly movable between first and second positions to cause said drive member to engage one or the other of said inner and outer tubular members, a first trip tab mounted on the inner end of said inner tubular member for moving said reversing assembly to its first position, and a second trip tab mounted on the inner end of said outer tubular member for moving said reversing assembly to its second position, said tabs serving to reverse the direction of rotation of said nozzle at trip points determined by the relative angular positions of said inner and outer tubular members, the combination of: vertical teeth formed on said outer tubular member on the inner surface thereof; and an adjustable screw mounted on the end of said internal assembly and extending into said internal assembly between said inner and outer tubular members, said screw having vertical gear teeth engaging the vertical gear teeth on said outer tubular member so that rotation of said screw adjusts the relative angular positions of said inner and outer tubular members to adjust the angular displacement of said inner and outer trip tabs from one another.

4,919,338

EYEBALL ASSEMBLY FOR AN EYEBALL FITTING

Richard A. Junk, Elkhorn, Wis., assignor to Sta-Rite Industries, Milwaukee, Wis.

Filed Jan. 24, 1989, Ser. No. 301,326
Int. Cl.[5] B05B *15/08*
U.S. Cl. 239—587 **14 Claims**



1. An eyeball assembly for use in an eyeball fitting, comprising:

an eyeball having a substantially spherical outer surface;

an axial passage extending through said eyeball and being defined at least in part by a first tapered surface and a second tapered surface, said first and second tapered surfaces being oppositely oriented relative to the axis of said passage so as to form a minimum transverse dimension of said passage at the juncture of said first and second tapered surfaces; and

an axially extending insert adapted for placement within said eyeball passage, said insert including a passage therethrough having an inlet end and an outlet end, for allowing fluid to pass through said eyeball, said insert including an outer wall defined at least in part by a reducing tapered surface disposed toward said inlet end and a continuously expanding tapered surface disposed toward said outlet end, said reducing and expanding tapered surfaces being oppositely oriented relative to the axis of said insert so as to form a minimum transverse dimension of said outer wall therebetween, with said expanding tapered surface providing a transverse dimension to said insert outlet end slightly greater than the minimum transverse dimension of the axial passage through said eyeball;

said insert being adapted for push-on engagement with said eyeball by placement of said insert within the axial passage through said eyeball and forcing said outlet end of said insert through the minimum transverse dimension of said eyeball passage so as to securely engage said insert within said eyeball passage.

4,919,339

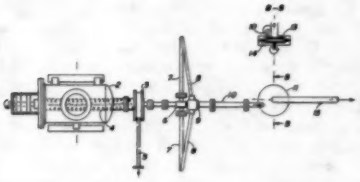
METHOD AND APPARATUS FOR IMPROVING THE GRINDING RESULT OF A PRESSURE CHAMBER GRINDER

Jouko Niemi, Pirkkala, Finland, assignor to Oy Finnpulva AB, Pirkkala, Finland

PCT No. PCT/FI87/00061, § 371 Date Oct. 31, 1988, § 102(e) Date Oct. 31, 1988, PCT Pub. No. WO87/06854, PCT Pub. Date Nov. 19, 1987
PCT Filed May 6, 1987, Ser. No. 267,124
Claims priority, application Finland, May 9, 1986, 861961
Int. Cl.[5] B02C *19/06*
U.S. Cl. 241—5 **5 Claims**

1. Method for improving the grinding result of a pressure chamber grinder, wherein the finely divided material to be ground is fed by means of a mechanical feeder device (1) into a pressurized equalizing tank (2), the possibly clodded material is made loose by means of a rotor in the equalizing tank, and the material thus made loose is transferred into a pre-grinder (3), wherein several grinding-gas jets are applied to the mate-

rial to be ground so that the material to be ground is fluidized, the fluidized material-gas flow is passed into a bisecting device (6), wherein it is divided into two component flows of equivalent magnitude and composition, each component flow is passed into the main grinding chamber (9) through a long accelerating nozzle (8) of its own, which said nozzle is directed so that a collision zone for the two component flows is formed in the centre point of the said main grinding chamber, characterized in that a solids-gas mixture ground in the main grinding chamber (9) is passed through an acceleration tube (10) into a rotary mechanical grinder (11) in a direction corresponding to the rotation direction of the grinder rotor (13) driven by an electric motor (12), whereby pivotably mounted grinding hammers of the grinder are arranged to break up the coarser particles, moved to the outer periphery of the grinder, before their exit through a central out-flow (15) of the grinder.

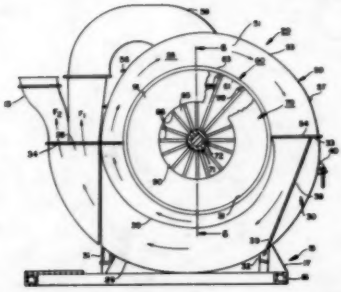


4,919,340

METHOD AND APPARATUS FOR FIBERIZING AND CELLULOSIC PRODUCT THEREOF

Milton Gerber, Offian, Ind., assignor to Advanced Fiber Technology, Inc., Bucyrus, Ohio

Filed Feb. 15, 1989, Ser. No. 311,211
Int. Cl.[5] B02C *23/34*
U.S. Cl. 241—5 **22 Claims**



1. Apparatus for fiberizing organic material to form a low density fibrous product comprising:

a housing defining;

a cylindrical rotor chamber having a central axis,

a volume-shaped passage formed around said rotor chamber,

a tangential outlet from said volute-shaped passage, and

axial inlet means for feeding said organic material into the central portion of said rotor chamber;

a discharge duct communicating with a radially outward portion of said tangential outlet for removing the fibrous product from the apparatus;

air return means communicating between a radially inward portion of said tangential outlet and said axial inlet means for recirculating a substantial portion of the air from said tangential outlet directly to said rotor chamber;

means for delivering said organic material to said axial inlet means;

a perforate cylindrical screen mounted in said housing about said axis between said rotor chamber and said volute-shaped passage;

a centrifugal blower rotor mounted in said rotor chamber for rotation about said axis and having a plurality of radial vanes with rakers mounted at the outer ends thereof, said rakers being closely spaced from the inner surface of said screen to prevent clogging of the openings in said screen; and

drive means for turning said rotor at a speed sufficient to generate a flow velocity for said air and fibrous product that is received in said volute chamber, that causes centrifugal concentration of said fibrous product in the radially outward portion of said volute chamber,

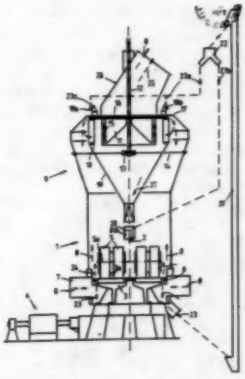
whereby said fibrous product is concentrated in the radially outward portion of the flow at the tangential outlet for delivery to said discharge duct and the radially inward portion of the flow that is received by said air return means at the radially inward portion of said tangential outlet is relatively free of said fibrous product.

4,919,341

GRINDING METHOD AND GRINDING APPARATUS

Ludger Lohnherr, Oelde-Sünninghausen, Fed. Rep. of Germany, assignor to Krupp Polysius AG, Fed. Rep. of Germany

Filed Dec. 23, 1988, Ser. No. 289,059
Claims priority, application Fed. Rep. of Germany, Jan. 18, 1988, 3801229
Int. Cl.[5] B02C *23/12*
U.S. Cl. 241—18 **10 Claims**



1. The method of comminuting material comprising:

(a) delivering fresh material to be comminuted to a grinding plate;

(b) grinding the material on said plate;

(c) discharging combined tailings and finished ground product from said plate into an air stream flowing upwardly relative to said plate;

(d) pneumatically conveying a portion of said finished ground product upwardly into a separator by said air stream;

(e) mechanically conveying said tailings and remaining portion of said finished ground material upwardly relative to said plate into said separator;

(f) introducing said tailings and said remaining portion of said finished ground product into said air stream;

(g) discharging an additional portion of said finished ground product by means of said air stream; and

(h) reintroducing material including said tailings separated

from said air stream onto said grinding plate along with additional fresh material to be comminuted.

4,919,342

METHOD OF PRETREATING A SAMPLE FOR X-RAY FLUORESCENCE ANALYSIS

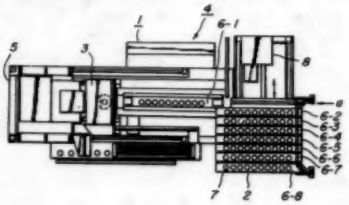
Akira Narukawa, Yokkaichi, Japan, assignor to NGK Insulators, Ltd., Japan

Filed Aug. 24, 1988, Ser. No. 235,560

Claims priority, application Japan, Aug. 31, 1987, 62-215181; Aug. 31, 1987, 62-215182; Aug. 31, 1987, 62-215184; Aug. 31, 1987, 62-215186; Sep. 9, 1987, 62-224160; Oct. 19, 1987, 62-261769

Int. Cl.[5] B02C *23/00*

U.S. Cl. 241—25 **3 Claims**



1. A method of pretreating a sample for X-ray fluorescence analysis comprising the steps of:

adding a sample under any powdery, granular or conglomerate conditions with graphite and a forming aid simultaneously or one after another;

crushing the sample under a dried condition; and press-forming the sample.

4,919,343

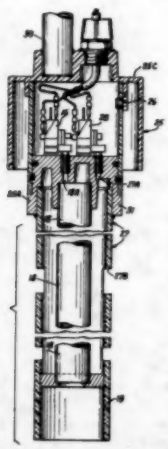
ANTI-FLOODING SEWAGE GRINDER PUMP LIQUID LEVEL CONTROL SYSTEM IN SEPARATELY MOUNTED CANISTER

Frank W. Van Luik, Jr., and Eric F. Cabahug, both of Schenectady, N.Y., assignors to Environment/One Corporation, Schenectady, N.Y.

Filed Sep. 25, 1989, Ser. No. 412,225

Int. Cl.[5] B02C *23/36*

U.S. Cl. 241—36 **20 Claims**



1. In a sewage grinder pump system having a collection tank and a sewage grinder pump driven by an electric motor disposed therein for grinding and discharging sewage collected in the tank under pressure through a pressurized sewage discharge outlet, the improvement comprising:

first pneumatically and electrically operable liquid sewage level sensing and control means calibrated for sensing a normal operating high and low liquid sewage level within the collection tank and automatically electrically exciting the sewage grinder pump electric motor to cause the pump to grind and pump down sewage collected in the tank to a normal low operating level;

second pneumatically and electrically operable alarm liquid sewage level sensing and control means calibrated for sensing an alarm high liquid sewage level within the collection tank which is higher than the normal high operating liquid sewage level and representative of overfilling of the collection tank due to a malfunction or surge overload, said second alarm liquid sewage level sensing and control means being electrically connected to and automatically providing an alarm operating condition output indication signal to an operator of the sewage grinder pump system; and

means for physically mounting both said first normal liquid sewage level sensing and control means and said second alarm liquid sewage level sensing and control means within liquid-tight and airtight diving bell-type enclosure means having an open lower end thereof exposed to and normally closed by the upper level of the collected liquid sewage contained in the sewage collection tank during both normal operating conditions and alarm high liquid sewage level operating conditions.

4,919,344

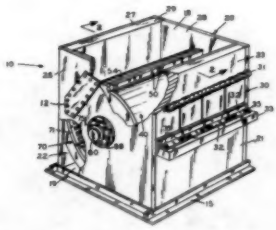
GRINDING MILL APPARATUS

Robert T. McKie, 2222 Stephen Ave., Boise, Id. 83706

Filed Jun. 5, 1989, Ser. No. 361,444

Int. Cl.[5] B02C *18/18*

U.S. Cl. 241—32 **18 Claims**



1. Grinding mill apparatus comprising:

a housing with inlet and outlet;

at least one anvils mounted within an opening of said housing, each of said anvils pivotally engaging said housing and each of said anvils provided with shear means for holding said anvils in a fixed break-away relationship with said housing;

a rotor mounted upon a shaft for rotation about a horizontal axis within said housing, said rotor comprising at least one sections, each section defining a portion of a cylinder axially offset from adjacent sections, each of said sections provided with a cutter having an orbit set at a selected distance from said anvils, and said rotor provided with at least one cavities, each of said cavities being filled with a lead-antimony alloy; and

grate means affixed to said housing for passing materials of a selected size through said housing outlet.

4,919,345

SHREDDING MACHINES

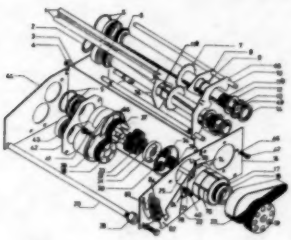
Geoffrey M. Burlington, East Sussex, and Stephen C. Watkins, Worcestershire, both of United Kingdom, assignors to Ofrex Group Holdings PLC, England

Filed Jan. 18, 1989, Ser. No. 298,030

Claims priority, application United Kingdom, Feb. 25, 1988, 8804437

Int. Cl.[5] B02C *25/00*

U.S. Cl. 241—36 **10 Claims**



1. In a shredding machine of the type including:

(A) a housing,

(B) a cutter assembly having a nip through which material to be shredded is fed, a pair of rotatable cutter shafts, and a plurality of cutter discs mounted on each shaft, the discs on one of the shafts being interleaved with the discs on the other of the shafts, and

(C) a drive for rotating the shafts in opposite directions, and for rotating the discs to cut the material fed into the nip into narrow strips,

the improvement comprising:

(a) said drive including an electric motor and an epicyclic gear mechanism having planet gears, said motor being operative for rotating the shafts through the intermediary of the gear mechanism in an operational mode, said planet gears being predominantly contained within a gear casing that has an interior toothed formation that engages the planet gears;

(b) means for constraining the gear casing against rotation relative to the housing during the operational mode, but permitting limited freedom of rotational displacement of the gear casing relative to the housing in the event that the motor is subjected to an overload; and

(c) motor overload sensing means for sensing such limited displacement of the gear casing and for changing the operational mode of the motor in response to such sensed displacement to protect the motor from damage.

4,919,346

ROTARY SCREEN DIVERTER AND SOLID WASTE HANDLING SYSTEM USING SAME

Joseph W. Chambers, Sr., Rancho LaCosta, Calif., assignor to Disposable Waste Systems, Inc. and Chambers Boyd McKinley and Associates, both of Santa Ana, Calif.

Filed Nov. 27, 1987, Ser. No. 125,951

Int. Cl.[5] B02C *18/22, 18/40, 23/36*

U.S. Cl. 241—46.02 **22 Claims**

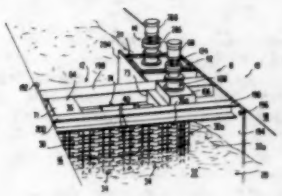
1. A solid waste handling system for screening and grinding solids entrained in an influent liquid stream flowing within a flow confining chute, said chute having a bottom wall and laterally spaced vertical sidewalls defining a flow channel for said stream, said system comprising:

at least one diverter horizontal rotating screen unit fixedly mounted within said chute, at least partially immersed in said influent liquid stream and extending transversely from one sidewall towards the other sidewall at an angle to the flow direction of said stream, said at least one screen unit comprising an elongated open frame assembly, an endless loop open mesh screen mounted for rotation on said frame assembly such that one upstream face of the screen is vertical and moves horizontally across the stream,

means for rotating said screen on said frame to divert a portion of the stream flow in the direction of screen movement, to cause solids of the influent stream larger than the mesh size of the screen to impact upon said one upstream face and to be momentarily captured thereon so as to move horizontally in the direction of screen movement, and at least one grinder unit fixedly mounted within said chute, within the flow stream and downstream of the endless loop screen, at the end of the screen unit in the direction of movement of said one upstream face,

said at least one grinder unit comprising: a grinder unit housing having an upstream facing inlet port and a downstream facing outlet port, stacked interengaging shredding members mounted within said grinder unit housing for rotation about their axes in the path of flow of said solids bearing influent through said housing from said inlet port to said outlet port, and means for rotating said shredding members such that;

the solids entrained in the diverted portion of the influent stream are driven to the end of the screen proximate to said at least one grinder unit, are automatically swept away from the screen by the diverted flow of influent passing over the end of the screen and are concentrated within the portion of the channel partially defined by the end of the screen unit and the said at least one grinder unit



and finely ground prior to discharge through said outlet port of said at least one grinder unit as waste effluent, and wherein said open frame assembly is fixedly mounted between said sidewalls of said chute, said open frame assembly including parallel upstream and downstream metal frame members fixedly mounted at least at one end to said chute and being spaced a distance on the order of the width of said screen unit and defining an elongated rectangular slot therebetween, said screen unit elongated open frame assembly mounted within said slot and being maintained in position in the path of said solids influent stream, and means including at least one short length angle bar fixedly mounted at one end to the other sidewall of said chute, and partially defining a rectangular cavity sized to and configured to said grinder unit housing and receiving the upper end of said grinder unit housing for maintaining the inlet port of said grinder unit positioned in the path of the diverted solids influent stream passing through said narrow channel portion, said laterally spaced metal frame members extend perpendicular to the direction of influent stream flow through said channel and are fixed at opposite ends to respective sidewalls of said chute, and wherein said grinder unit is supported at its upper end by two of said short length angle bars fixedly mounted, at one end, to said other sidewall, proximate to the narrow flow channel portion at the end of the screen unit, a vertical plate spans between and is fixed to respective ends of said short length angle bars remote from said other sidewall and extends parallel to said other sidewall, and wherein the end of said screen unit overlaps the end of the

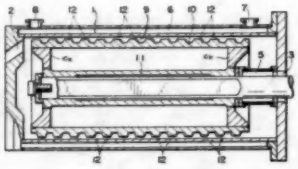
downstream grinder unit remote from each other chute sidewall, and wherein a vertical deflector wall has a downstream vertical edge fixed to the grinder unit along one side of the inlet port and extends obliquely from said grinder unit to the downstream side of said screen unit and has an upstream vertical edge at a position proximate to the downstream face of the endless loop screen so as to insure retention of solids captured on the screen within the portion of the influent passing via the narrow channel portion to the inlet port of the grinder unit.

4,919,347

DISPERSING AND GRINDING APPARATUS

Mitsuo Kamiwano, Yokohama, and Yoshitaka Inoue, Tokyo, both of Japan, assignors to Inoue Seisakusho (Mfg) Co., Ltd., Japan

Filed Dec. 27, 1988, Ser. No. 290,314
Claims priority, application Japan, Dec. 28, 1987, 62-329959
Int. Cl.[5] B02C *17/16, 17/18*
U.S. Cl. 241—65 **17 Claims**



1. A dispersing and grinding apparatus comprising: a vessel for receiving a material to be processed and a grinding medium, the vessel having an inlet at an upstream end for admitting the material into the vessel and an outlet at a downstream end for discharging processed material from the vessel; a rotor mounted to undergo rotation within the vessel and being positioned relative to the vessel to define an annular flow path between an inner wall of the vessel and the outer peripheral surface of the rotor; and guiding means disposed on one of the rotor peripheral surface and the vessel inner wall for guiding the flow of the mixture of material and grinding medium in the circumferential direction about the annular flow path in conjunction with lengthwise flow of the material along the flow path from the vessel inlet to the vessel outlet in response to rotation of the rotor to thereby attain grinding of the material by the grinding medium and uniform dispersing of the ground material, the guiding means including an array of forward guide surfaces positioned and configured to impart forward motion to the mixture in response to rotation of the rotor and an array of rearward guide surfaces positioned and configured to impart rearward motion to the mixture in response to rotation of the rotor, the forward and rearward guide surfaces being substantially linear surfaces lying along imaginary helices.

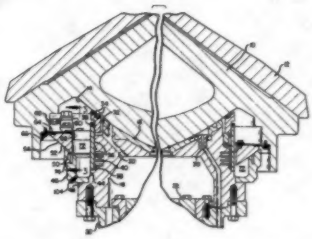
4,919,348

DUST SEAL FOR GYRATORY ROCK CRUSHERS

Louis W. Johnson, and Bruce G. Johnson, both of 2435 Prairie Rd., Eugene, Oreg. 97402

Filed Oct. 10, 1989, Ser. No. 418,857
Int. Cl.[5] B02C *2/04*
U.S. Cl. 241—215 **14 Claims**

1. A gyratory rock crusher comprising:
a base frame,
a crusher cone,
inner drive and support means on said frame moving said cone in a gyratory movement,
cooperating spherical surfaces on said base frame and cone supporting said cone in said gyratory movement,
a first annular seal member on said base frame,
a second annular seal member on said crusher cone,
said first and second seal members having cooperating spherical surfaces with slidable rubbing surface engagement with each other in the gyratory movements of said cone,
annular groove means in one of said seal members opening through said spherical rubbing surface thereof,



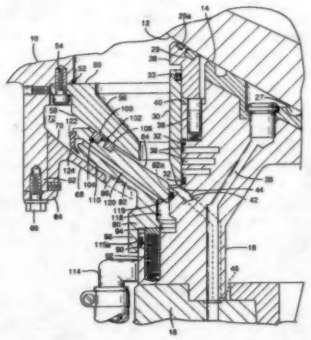
and air moving means communicating with said annular groove means directing air currents through said groove means to intercept dust moving along said spherical surfaces and to move such dust away from inner portions of said crusher.

4,919,349

DUST SEAL FOR GYRATORY ROCK CRUSHERS

Louis W. Johnson, and Bruce G. Johnson, both of 2435 Prairie Rd., Eugene, Oreg. 97402

Filed Oct. 10, 1989, Ser. No. 419,031
Int. Cl.[5] B02C *2/04*
U.S. Cl. 241—215 **17 Claims**



1. A gyratory rock crusher comprising a base frame,
a base frame,
a crusher cone,
inner drive and support means on said frame moving said cone in a gyratory movement,
cooperating spherical surfaces on said base frame and cone supporting said cone in said gyratory movement,
a base seal on said base frame,
a cone seal on said crusher cone,
one of said base seal and cone seal having a recessed portion and the other of said base seal and cone seal having a portion thereof projecting into said recessed portion,
said recessed and projecting portions having cooperating upper and lower spherical surfaces arranged for relative

concentric movement upon gyratory movement of said cone,

said projecting portion having a thickness less than the distance between the upper and lower surfaces of said recessed portion,

forced air means forcing air into said recessed portion,

seal means between the upper surfaces of said recessed and projecting portions,

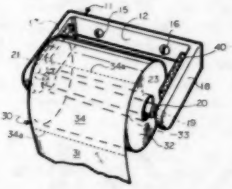
and means resiliently holding said base seal upwardly against said cone seal to provide sealing engagement between said upper surfaces of said two seal means and to provide a space between said lower surfaces whereby to form a dust seal of moving air between said base and cone seals.

4,919,350

HOLDER/DISPENSER FOR PAPER IN ROLL FORM

Norman T. Miller, 4201 Burnham, Toledo, Ohio 43612

Filed Nov. 25, 1988, Ser. No. 275,948
Int. Cl.[5] A47K *10/32, 10/04*
U.S. Cl. 242—55.2 **17 Claims**



1. In combination:

(1) a bracket/reservoir for a roll of paper, including, wall mounting means, a connected pair of parallel arms having facing surfaces and a freely rotatable spool, adapted to carry said roll of paper, carried by and between said arms,

(2) a supply roll of paper, having spaced lines of weakness, spiral wound upon itself to form said supply roll and having a central cylindrical passageway telescopically and loosely surrounding said spool, and

(3) means constructed and arranged on at least one of said facing surfaces, proximate the spiral edges of said paper in roll form, for frictional contact with said roll to resist rotation sufficient to overcome integrity of said line of weakness.

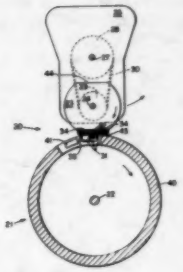
4,919,351

WEB REWINDER HAVING IMPROVED CHOP-OFF MECHANISM

Kevin B. McNeil, Maineville, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 7, 1989, Ser. No. 320,200
Int. Cl.[5] B26F *3/02;* **B65H** *35/10*
U.S. Cl. 242—56 R **7 Claims**

1. An improved chop-off means in a rewinder apparatus of the type which includes means for unwinding a parent roll of web material and forwarding unwound web through the apparatus, means for providing transverse lines of weakening in said web at sheet length intervals in the machine direction, chop-off means for breaking the web along lines of weakening at product roll length intervals, and means for winding the product roll lengths of web into product rolls, and in which the chop-off means comprises a bedroll, a chop-off roll, means for rotating the bedroll and the chop-off roll in timed relation, and a set of chop-off blades, some of which are mounted on the bedroll and some of which are mounted on the chop-off roll, and which blades are rotationally moved into and then out of a non-contacting meshed relation by simple rotational motion of the bedroll and the chop-off roll only during a web breaking, roll ending event, said improvement comprising means for continuously maintaining the chop-off blades of both the bedroll and the chop-off roll in mutually parallel relation and synchronized velocity.

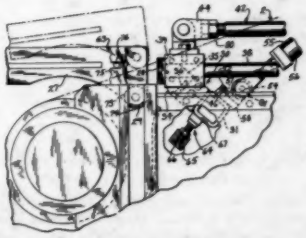


4,919,352

WEB AND TRANSFER CUTOFF APPARATUS

Gerald W. Terp, Green Bay, and Edward F. Stanek, Gillett, both of Wis., assignors to Magna-Graphics Corporation, Oconto Falls, Wis.

Filed Oct. 25, 1988, Ser. No. 262,453
Int. Cl.[5] B65H *19/20*
U.S. Cl. 242—56 A **18 Claims**



1. In a web winding apparatus having a rotating turret means including a plurality of core support means circumferentially spaced about the turret means, means for rotating said turret means to sequentially move the support means between a winding station and an unloading station, means for guiding a web about the support means at the winding station, said core support means moving vertically and laterally from said winding station to said unloading station, a knife unit having a knife support means mounted for linear movement toward and from said winding station and located in an operative cutting position adjacent said web downstream of said support means with said knife support means positioned at said winding station, said knife unit including a knife member pivotally mounted to the knife support means, and power drive means for pivoting said knife member through a cutting motion and severing said web.

4,919,353

CARDBOARD WEB FEEDING DEVICE FOR CORRUGATOR

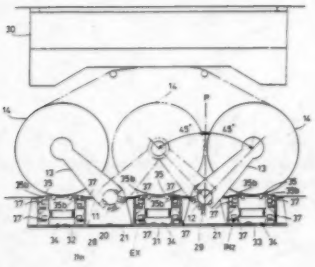
Eiichi Isowa, Nagoya; Hideshi Kawai; Harumi Kajita, both of Kasugai, and Hiroki Matsui, Kasugai, all of Japan, assignors to Isowa Industry Co., Ltd., Aichi, Japan

Filed Aug. 26, 1988, Ser. No. 237,223

Claims priority, application Japan, Sep. 3, 1987, 62-221623; Jul. 6, 1988, 63-90237[U]

Int. Cl.[5] B05H *19/30*

U.S. Cl. 242—58.6 **10 Claims**



8. A web feeding device for a corrugator comprising:

a mill roll stand consisting of two swing arm mechanisms, each having a pair of swing arms supported on a pivotal shaft which can be turned with a predetermined angle to positive and negative directions relative to a perpendicular line extending upwardly from said pivotal shaft, disposed in such a way that the pivotal shafts thereof may be parallel to each other;

a conveyor for transporting the web rolls disposed between said two swing arm mechanisms to extend parallel to said pivotal shafts, said web roll transporting conveyor disposed intermediate between said two swing arm mechanisms comprising a conveyor for carrying in web rolls; and

two web roll transporting conveyers disposed at outer areas relative to the swing arm mechanisms, respectively, to be extended parallel to said pivotal shafts, said two web roll transporting conveyors disposed at outer areas relative to the two swing arm mechanisms, respectively, comprising conveyors for carrying out web rolls.

4,919,354

APPARATUS FOR REPLACING ROLLS OF CUSTOMER FILMS IN COPYING MACHINES

Leonhard Huber, Gloss; Erich Nagel, Anzing; Bernd Payrhammer, Munich; Peter Lermann, Weyarn; Helmut Treiber, Munich, and Herbert Wilsch, Unterhaching, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

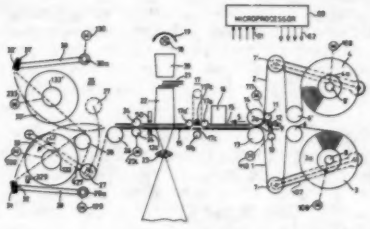
Filed Oct. 28, 1988, Ser. No. 264,311

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1987, 3737788

Int. Cl.[5] B65H *19/28, 75/28*

U.S. Cl. 242—67.3 R **25 Claims**

1. Apparatus for replacing in a copying machine rolls of photographic films which are spliced together end-to-end into elongated webs, comprising first and second supports arranged to respectively carry and pay out discrete rolls of convoluted webs and to maintain the rolls thereon in a common plane; guide means defining an elongated path which extends through the copying machine; means for advancing the leaders of webs along said path; first and second holders for rotary web collecting devices downstream of said path; means for attaching the leaders of webs to collecting devices on said holders so that the collecting devices can draw the webs from the path; means for locating the leaders of webs adjacent a portion of said path in the range of said advancing means, including a carriage which is movable between a plurality of different positions, said advancing means including at least one first portion which is supported by said carriage and at least one second portion adjacent said carriage, said first and second portions of said



advancing means cooperating in at least one position of said carriage to hold the leader of the web between them adjacent said portion of said path; and means for actuating said advancing means so that the leader which is adjacent said portion of said path is automatically advanced along said path to said attaching means when the collecting device on one of said holders has completed the collection of a web.

4,919,355

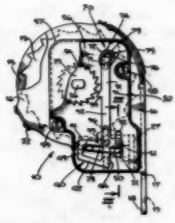
LOCKING PAWL ACTUATING MEANS FOR EMERGENCY LOCKING SAFETY BELT RETRACTOR

Ronald Dickson, Troy, Mich., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Jul. 18, 1988, Ser. No. 220,771

Int. Cl.[5] B60R *22/40*

U.S. Cl. 242—107.4 A **11 Claims**



1. In an emergency locking safety belt retractor having a safety belt storage spool, a locking ratchet turnable with the spool, a locking pawl for preventing spool rotation when engaged with said locking ratchet, a programming ratchet turnable with said spool and a locking pawl actuating means operable in response to a change in vehicle inertia sensed by a vehicle inertia sensor, the improvement in locking pawl actuating means comprising:

a flexible member having a programming ratchet engaging tooth;

member actuating means associated with said sensor and member for moving said member from a start position through an initial movement to place said tooth into engagement with said programming ratchet when a change in vehicle inertia is sensed by said sensor;

connecting means associated with said locking pawl and said member for moving said locking pawl into engagement with said locking ratchet when said member is moved through a programming movement thereof under the urging of said programming ratchet turning against said

member tooth after said tooth has been placed in engagement with said programming ratchet by said initial movement of said member; and

camming means for camming said flexible member into a flexed condition and thereafter directing it out of engagement with said programming ratchet in a flexing and unflexing movement of said member under the urging of said programming ratchet turning against said tooth after said programming movement of said member has moved said locking pawl into engagement with said locking ratchet preliminary to lock up of said locking pawl and locking ratchet and while said member remains connected to said locking pawl by said connecting means.

4,919,356

VIDEOTAPE TAPE GUIDE

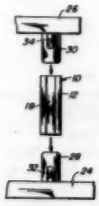
Kiyoshi Nakagawa, Ishikawa, Japan, assignor to Fuji Kogyo Kabushiki Kaisya, Mattou, Japan

Filed Oct. 11, 1988, Ser. No. 255,378

Claims priority, application Japan, Oct. 29, 1987, 62-166174

Int. Cl.[5] B65H *23/04, 27/00*

U.S. Cl. 242—199 **3 Claims**



1. A videotape guide for guiding a videotape in a videocassette, said videocassette formed of a bottom case portion and a top lid portion, said videotape guide comprised of:

an elongated cylinder having a first open end and a second open end, wherein said first open end is positioned in an abutting relationship with the bottom case portion of the videocassette, and wherein said second open end is positioned in an abutting relationship with the top lid portion of the videocassette,

means forming a groove extending longitudinally from said first open end of the elongated cylinder to said second open end of the elongated cylinder, said groove defining spaced-apart surfaces extending longitudinally along the length of the elongated cylinder,

said spaced-apart surfaces being formed with a series of spaced recesses.

4,919,357

SHIP-SHAPED VIDEO-TAPE REWINDER

Long-Jing Lin, No. 53 Yih Yeong Rd., 80257 Lin Ya Dist., Kaohsiung, Taiwan

Filed Dec. 12, 1988, Ser. No. 283,456

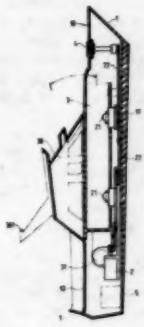
Int. Cl.[5] G11B *15/32;* **G02B** *6/04*

U.S. Cl. 242—199 **5 Claims**

1. A tape cassette rewinder, comprising:

(a) a boat-shaped housing having a base, a deck above the base, a prow at the front of the housing, a stern at the rear of the housing, and a lid-like boat member pivotably mounted on the housing between the prow and the stern for movement between a lid-open position and a lid-closed position, said boat member having an upper compartment generally resembling a wheelhouse and situated above the deck in the lid-closed position, and a lower compartment in which a tape cassette is insertable in the lid-open position and in which the tape cassette is contained within the housing between the base and the deck in the lid-closed position;

(b) rewinding means mounted within the housing, and operative for rewinding the tape cassette in the lid-closed position, and for automatically terminating the rewinding when the rewinding is completed, said rewinding means including a rotary, main winding head engageable with the tape cassette in the lid-closed position, an electrically-powered motor having a drive shaft, and a gear transmission between the drive shaft and the head for rotating the same;



(c) lid-opener means for automatically opening the boat member when the rewinding is completed, including a movable swing arm pivotably mounted on the base, and having one end operatively connected to the rewinding means and movable by the rewinding means to a release position, said swing arm also having an opposite end at the prow; and

(d) means for manually opening the boat member to enable insertion of a tape cassette prior to rewinding, including a manually operable push button on the deck at the prow and operatively connected to the opposite end of the swing arm to pivot the swing arm to the release position.

4,919,358

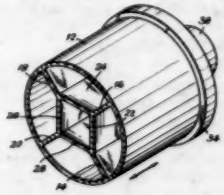
REWIND SHELL FOR TEXTILES

Emil Innocenti, Sr., 166 Beverly Rd., Hawthorne, N.J. 07506, and Philander N. Alward, 87 E. Crescent Ave., Allendale, N.J. 07401

Continuation of Ser. No. 197,111, May 20, 1988, abandoned. This application Aug. 21, 1989, Ser. No. 396,535

Int. Cl.[5] B65H *18/08, 75/08*

U.S. Cl. 242—68.4 **4 Claims**



1. A rewind shell assembly, of particular utility in wet processing in the textile industries, comprised of:

a unitary extrusion of an extrudable metal providing, in transverse cross-section, radially extending webs extending in angularly spaced relation radially of a central longi-

tudinal axis of said extrusion, and each interconnected with the other at a radially inner longitudinal edge of each said web;

a laterally extending flange integral with each said web at a radially outer edge of each said web, each flange being curved about a radius of said central longitudinal axis; and,

a drive member separate from said rewind shell and inserted into each axial end of said unitary extrusion, each said drive member including a radially extending flange portion, and, driving dogs formed integrally with said radially extending flange portion and respectively extending axially into said unitary extrusion, said respective driving dogs being of substantially greater axial length than the wall thickness of said respective webs and each having axially extending walls complimentary to an adjacent pair of said webs and their associated said flanges for each said driving dog to internally engage a said adjacent pair of said webs and said associated flanges in supporting and driving relationship therewith;

said driving dogs being operative to prevent movement of said webs from their radially extending orientation and being operative to prevent collapsing movement of said laterally extending flanges in directions radially inwardly of said unitary extrusion.

4,919,359

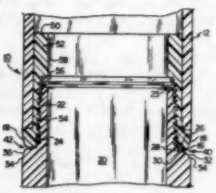
REUSABLE HIGH SPEED WINDING TUBE

Stephen S. Powel, 4305 Tallwood Dr., Greensboro, N.C. 27410, and Robert J. Darby, 2715-A Patriot Way, Greensboro, N.C. 27408, assignors to Stephen S. Powel and Robert J. Darby, both of Greensboro, N.C.

Filed Mar. 9, 1989, Ser. No. 321,279

Int. Cl.[5] B65H *75/28*

U.S. Cl. 242—125.1 **9 Claims**



1. A reusable high speed winding tube comprising:

(a) a hollow tube having an outer substantially cylindrical surface adapted to support multiple wraps of a fibrous or filamentary yarn thereon;

(b) an end cap having an outer cylindrical surface, means on said hollow tube and end cap for releasably mounting said end cap on at least one end of said hollow tube;

(c) a starting groove between said hollow tube an said end cap;

(d) said hollow tube including:

(i) a cylindrical shell of a prescribed length and an outer diameter compatible with conventional yarn carriers, having a wall thickness in the range of 0.062 inches and 0.200 inches, and being formed of a material selected from the group consisting of steel, aluminum, lightweight metallic alloys and a polymeric material reinforced with fibers selected from the group consisting of aramids, carbon, ceramic, glass and hybrids thereof;

(ii) at least one insert secured to the inner surface of the marginal end of said hollow tube adjacent said end cap;

(iii) said insert having fastening means associated therewith for receiving said end cap in secure assembled relation thereto;

(e) whereby said yarn carrier is reusable and capable of withstanding the stress imposed by winding speeds of 10,000 meters per minute and above and yet includes the same effective inner and outer diameter.

4,919,360

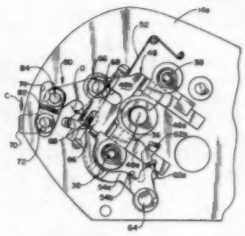
CLUTCH MECHANISM FOR BAIT CASTING FISHING REEL

Dennis E. Roberts, Owasso, Okla., assignor to Zebco, Corporation, Tulsa, Okla.

Filed Jul. 21, 1988, Ser. No. 222,572

Int. Cl.[5] A01K *89/015*

U.S. Cl. 242—260 **2 Claims**



2. A fishing reel, comprising:

a housing including side frame members;

a spool including a transverse spool shaft extending between the side frame members;

pinion gear means slidably mounted on the spool shaft for movement between a first position for rotating the spool shaft and a second position for rotating free of the spool shaft;

clutch means mounted on the housing for linear movement perpendicular to the spool shaft for moving the pinion gear means between said positions;

actuator means at least partially exposed exteriorly of the housing for manual engagement and mounted on the housing for linear movement oblique to the linear movement of the clutch means;

a bell crank pivotally mounted on the housing and operatively associated between the clutch means and the actuator means for moving the clutch means and, therefore, the pinion gear means from said first position to said second position in response to linear movement of the actuator means, the bell crank means having first and second angularly oriented legs and being pivotally mounted on the housing at the juncture of the legs,

said clutch means being mounted on the housing for linear movement by a pin-and-slot means, with the pin thereof defining the pivot means for the bell crank;

first means for operatively connecting between the actuator means and the bell crank; and

second means for operatively connecting between the bell crank and the clutch means.

4,919,361

FISHING SPINNING REEL

Takehiro Kobayashi, Hiroshima, Japan, assignor to Ryobi Ltd., Hiroshima, Japan

Continuation of Ser. No. 46,162, May 5, 1987, abandoned. This application Jan. 30, 1989, Ser. No. 304,006

Claims priority, application Japan, May 12, 1987, 61-71804[U]

Int. Cl.[5] H01K *89/02*

U.S. Cl. 242—309 **6 Claims**

1. A fishing spinning reel comprising:

(a) a reel body;

(b) a master gear shaft rotatably mounted in said reel body;

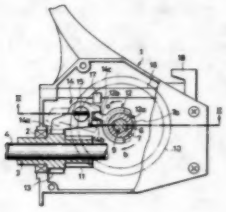
(c) a master gear attached to said master gear shaft;

(d) rotating means for rotating said master gear shaft and said master gear;

(e) a cylindrical shaft rotatably mounted in said reel body and operatively connected to said master gear;

(f) a ratchet provided integral with and rotatable together with said cylindrical shaft;

(g) an arcuate spring member rotatably mounted on and frictionally engaged with said master gear shaft, said spring member having a protrusion extending radially outward from substantially the center of the arc of said arcuate spring member, and said spring member having a



circumferential length slightly greater than the semi-circumference of said master gear shaft;

(h) a pawl member pivotally mounted on said reel body and having a substantially U-shaped recess therein, said recess being engaged with said protrusion so that said pawl member is turned clockwise or counterclockwise when said master gear shaft is rotated and said pawl member engages with said ratchet when said rotating means is turned in a reverse direction to prevent reverse rotation of said cylindrical shaft and said pawl disengages from said ratchet when said rotating means is turned in a forward direction to permit rotation of said cylindrical shaft.

4,919,362

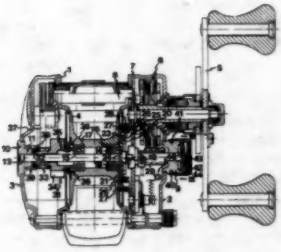
FISHING REEL OF THE MULTIPLIER TYPE

Arne Johansson, Mörrum, Sweden, assignor to ABU Garcia Producktion AB, Svangsta, Sweden

Filed Jun. 2, 1989, Ser. No. 360,617

Int. Cl.[5] A01K *89/02*

U.S. Cl. 242—303 **3 Claims**



1. A fishing reel of the multiplier type, comprising

a frame with two side plates;

a support bearing element on each of said side plates;

a shaft which extends through said frame and the ends of which are supported by said support bearing elements;

rotary bearing means axially displaceably mounted on said shaft;

a line spool rotatably mounted on said shaft by means of said rotary bearing means;

friction brake means for braking the rotation of the line spool;

shifting means provided at one end of said shaft for axially shifting said shaft in one direction;

driver means provided on said shaft and adapted, upon axial shifting of the shaft in said one direction, to urge the line spool towards said friction brake means to increase the braking effect thereof; and

resilient means for resiliently counteracting shifting of said shaft in said one direction so as to ensure return of the shaft in the opposite direction, said resilient means having a through opening in which said shaft is inserted, and including means for retaining said shaft against rotation, said one end of said shaft having a circumferential groove which extends throughout at least a portion of the circumference of the shaft and in which said resilient means engages when said shaft is inserted in the opening of said resilient means, and said shaft being retractable from and reinsertable into said opening under resilient expansion thereof.

4,919,363

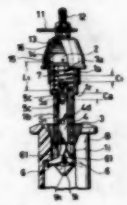
BOBBIN HANGER

Yoji Kitamura, 1-18, Deguchi 1-chome, Hirakata-shi, Osaka-fu, Japan

Filed Aug. 21, 1989, Ser. No. 396,126

Int. Cl.[5] B65H *49/00, 49/22*

U.S. Cl. 242—130.2 **7 Claims**



1. A bobbin hanger comprising:

a bobbin hanging tube having an upper expanded section and a lower reduced section extending from the expanded section;

a sliding member pivotally supporting a pair of bobbin holding fingers at a lower position thereof, pivotally supporting a retaining member integrally provided with a ratchet and retaining projections at an upper position thereof, and axially slidably inserted in the reduced section of the bobbin hanging tube;

a ratchet operating member having an operating leg for operating the ratchet of the retaining member; and

a weight axially slidably put on the reduced section of the bobbin hanging tube, said weight being capable of being pushed up by a bobbin to push up the sliding member so that the retaining member is turned substantially through an angle of 90° by the operating leg of the ratchet operating member engaging the ratchet of the retaining member to bring the retaining projections to a position for resting on the inner upper end of the reduced section of the bobbin hanging tube to retain the sliding member at a position where the bobbin holding fingers are allowed to swing outward to engage the inner surface of the bobbin;

characterized in that the position of the upper end of the weight at the completion of turning of the retaining member is 4 to 10 mm below the lower end of the expanded section of the bobbin hanging tube, and the bobbin holding fingers have a shape capable of preventing the retraction of the bobbin holding fingers into the interior of the bobbin hanging tube when acted upon by a horizontal force.

4,919,364

PROPULSION SYSTEM FOR HYPERSONIC FLIGHT

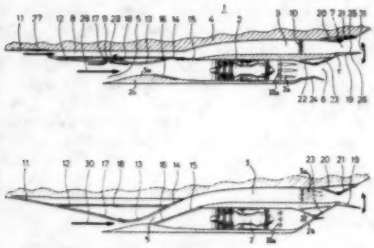
Helmut John, Munich, and Otfrid Herrmann, Hohenthann, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Apr. 7, 1989, Ser. No. 335,053

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1988, 3811614

Int. Cl.[5] B64D *27/20*

U.S. Cl. 244—55 **7 Claims**



1. An air breathing propulsion system for hypersonic flight of an aircraft having a body, comprising ramjet means mounted in a location directly next to said body, turbo-jet means mounted away from said body next to said ramjet means, so that said ramjet means are located between said body and said turbo-jet means, said ramjet means and said turbo-jet means having separate thrust nozzles, common air intake means arranged for supplying air to said ramjet means and to said turbo-jet means, first flap means for controlling an air intake of said common air intake means separately for said ramjet means and for said turbo-jet means, body boundary layer guide channel means beginning upstream of said air intake means for separating a body boundary layer from an air intake for said turbo-jet means when said turbo-engine means are operating, said boundary layer guide channel means leading into said ramjet means, and second flap means arranged for opening said guide channel to lead a boundary layer through said guide channel and through said ramjet means when said ramjet means are not operating and to close said guide channel for leading a boundary layer into an air intake for said ramjet means when said ramjet means are operating while an air intake for said turbo-jet means is closed.

4,919,365

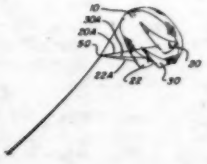
AIRFOIL

Arthur W. Mears, 5212 Lone Tree Dr., Loveland, Colo. 80537

Filed Jun. 6, 1988, Ser. No. 202,678

Int. Cl.[5] B64C *31/06*

U.S. Cl. 244—153 R **6 Claims**



1. A lighter-than-air inflatable device comprising:

an aerodynamically shaped envelope having a horizontal and vertical axis and having a circular cross-section taken along the horizontal axis; said envelope having a upper portion and a lower portion communicating with each other in a manner that said envelope will retain a gas and its aerodynamic shape upon being inflated through a inflation means;

a guidance means mounted rearwardly on and extending below said lower portion running approximately parallel to the longitudinal axis of said envelope;

a tether line means secured to both said envelope and said guidence means for tethering said envelope and providing manuverability input to said envelope.

4,919,366

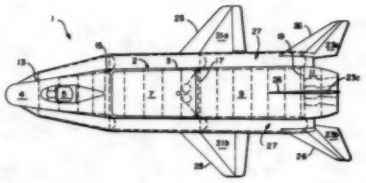
HEAT RESISTIVE WALL ASSEMBLY FOR A SPACE VEHICLE

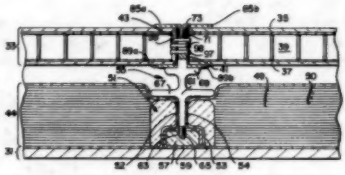
Leonard N. Cormier, Reno, Nev., assignor to MMI Incorporated, Reno, Nev.

Filed Sep. 23, 1988, Ser. No. 248,412

Int. Cl.[5] B64C *1/38*; B64G *1/58*

U.S. Cl. 244—160 **34 Claims**





1. A heat resistive wall assembly for a space vehicle, comprising:

a. an inner wall formed from a heat resistive metal for providing both structural support for the vehicle and a heat sink for absorbing and dissipating heat applied to the outer surface of the vehicle;

b. an outer wall formed from a heat resistive metal mounted over said inner wall in spaced relation thereto for radiating away heat applied to the outer surface of the vehicle, and

c. at least a first resilient, evacuated insulator means disposed between said inner and outer walls to retard the radiant transmission of heat through said wall structure,

wherein the space between the inner and said outer wall is vented so that said outer wall bears no atmospheric pressure load, and wherein the resiliency of said insulator means causes it to define a lengthened heat path between said inner and outer wall when ambient atmospheric pressure is relieved.

4,919,367

SATELLITE ATTITUDE CONTROL

Melville T. Whitcomb, 8 Glidden St., Waldoboro, Me. 04572

Filed Feb. 29, 1988, Ser. No. 162,074

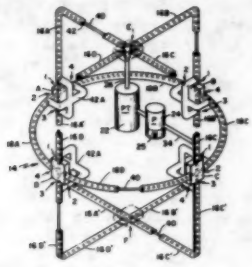
Int. Cl.[5] B64G *1/28*

U.S. Cl. 244—164 **11 Claims**

1. The method of controlling the attitude of a satellite in space by thruster reaction forces which comprises

discharging at least one jet of pressurized reaction mass

gaseous fluid in a predetermined direction into an enclosed evacuated endless volume on board the satellite,



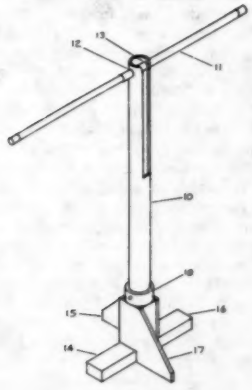
scavenging the discharged fluid from said volume, and compressing and storing the scavenged fluid for re-use.

4,919,368

PORTABLE STAND WITH REMOVABLE BAR

Elmer E. Garrett, Box 40, Hut Hill Rd., Bridgewater, Conn. 06752

Filed Mar. 27, 1989, Ser. No. 329,389
Int. Cl.[5] F16L 3/00
U.S. Cl. 248—121 **1 Claim**



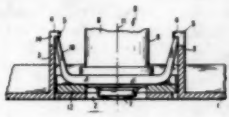
1. A portable stand comprised of a vertical member with a horizontal bar removably mounted at the upper end and with said vertical member having a pocket for holding the removed bar, and a slot extending from the top axially part way to the bottom with said slot being of width sufficient to permit entry of the bar laterally into said pocket, and with the upper end of said slot being made narrower than the diameter of said bar to provide a detent action as said bar is moved laterally into said pocket, and with said vertical member being supported by four legs two of which are fixed to said vertical member and two of which are fixed axially to said vertical member and free to rotate together between positions normal to the fixed legs and positions parallel to said fixed legs.

4,919,369

LOUDSPEAKER MOUNTING MECHANISM

Werner Stehn, Hemmingen, Fed. Rep. of Germany, assignor to Electronic-Werke Deutschland GmbH, Villingen-Schwenningen, Fed. Rep. of Germany

Filed Jun. 2, 1989, Ser. No. 363,839
Int. Cl.[5] H04R 1/02
U.S. Cl. 248—27.3 **11 Claims**



1. An arrangement including a loudspeaker and a panel comprising in combination:

an opening in said panel for receiving said loudspeaker;

a plurality of arms arranged on opposite sides of said opening, the ends of said arms being angled inwardly toward said opening to form lips, and

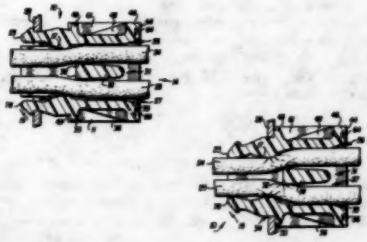
a plurality of fingers on said loudspeaker, said fingers extending outwardly away from an axis of said loudspeaker, said fingers and said lips being resiliently engageable as said loudspeaker is inserted onto said panel and the ends of said fingers lock to said lips to attach said loudspeaker to said panel.

4,919,370

CABLE FITTING

William B. Martin, 772 Twin View Pl., Pleasant Hill, Calif. 94523; John W. Martin, 743 Santa Anna Dr., Pittsburgh, Calif. 94565, and Mark Bryan, 110 S. Cornish Ave., Lodi, Calif. 95242

Filed Feb. 17, 1989, Ser. No. 311,750
Int. Cl.[5] F16L 5/00
U.S. Cl. 248—56 **24 Claims**



1. A fitting for securing cable and the like to an enclosure, comprising:

(a) housing means having a passageway therethrough, for enclosing the cable;

(b) means for longitudinally dividing said passageway into a plurality of channels, said channels being adapted for receiving at least one cable each, said means for longitudinally dividing said passageway having a rounded entry end and providing a cable clamp point at a second end thereof; and

(c) means for securing said fitting to said enclosure compris-

ing combination positive mechanical cable clamp adapted for both securing said fitting to said enclosure and for clamping said cables in said housing in cooperation with said cable clamp point.

4,919,371

SEALING PASSAGE ARRANGEMENT FOR A PIPELINE

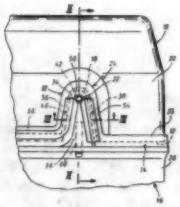
Helmut Bonfert, Böblingen; Thomas Hardt, Ostfildern; Rolf Klumpp, Kernen, and Wolf-Dietrich Wagner, Stuttgart, all of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Stuttgart, Fed. Rep. of Germany

Filed Oct. 31, 1988, Ser. No. 264,524

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1987, 3736778

Int. Cl.[5] F16L 5/00

U.S. Cl. 248—56 6 Claims



1. Sealing passage arrangement for a pipeline through a wall aperture in a housing exposed to lubricant medium, said housing being attachable so as to be sealed by a housing edge delimiting an open side of the housing on a receiving surface of an internal combustion engine, having a seal element made of elastomer material which tightly closes the wall aperture and is penetrated by the pipeline connected inside the housing, wherein the wall aperture starts from the housing edge and extends into the housing wall,

wherein the seal element includes a first part and second part, said first part being retained upright on the receiving surface and being releasably in engagement with the wall aperture which receives the second part,

wherein the two mutually abutting first and second seal element parts enclose the pipeline to form a seal between themselves,

wherein side edges of the wall aperture converge in a direction opposite to the housing edge and merge into a circular arcuate edge part, and

wherein the second part of the seal element exhibits two seal members which are in engagement each with a side edge of the wall aperture on the one hand and each with a longitudinal groove of the first part of the seal element on the other hand.

4,919,372

TRANSIT FOR CABLES AND PIPES

Michael Twist, and Alan Platt, both of Manchester, England, assignors to Hawke Cable Glands Limited, England

Continuation of Ser. No. 11,588, Feb. 6, 1987, abandoned. This application Dec. 23, 1988, Ser. No. 289,448

Claims priority, application United Kingdom, Feb. 11, 1986, 863368

Int. Cl.[5] H02G 3/28; F16L 5/00

U.S. Cl. 248—56 18 Claims

1. A lead-through transit for cables or pipes comprising:

a rigid outer frame defining a rectangular opening having opposed frame side walls and opposed frame end walls,

a plurality of modular blocks of resilient material arranged in rows within said opening,

said rows extending between said frame side walls and partially filling said opening between said frame end walls,

each said block being of rectangular section extending through said opening, said blocks comprising cable blocks which surround a respective cable or blanking blocks which blank off a modular space,

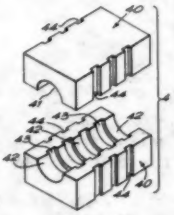
said cable blocks comprising two complementary half-blocks defining a lead-through passageway extending normal to the plane of said opening, through which passageway the cable extends between entry and exit ends of said passageway,

a compression means located between said frame side walls and completing filling of said opening between said frame end walls to compress and seal said blocks relative to one another and to said frame, and to compress and seal each cable block onto and around its respective cable,

wherein each said cable block comprises:

a plurality of axially spaced apart internal annular recesses, said recesses being spaced from said entry and exit ends of said passageway,

a series of axially spaced apart internal land portions separated by said recesses, each said land portion having an axially extending sealing face and axially spaced opposed



land side walls, the side walls, in the uncompressed state, extending generally radially from the bottoms of the recesses up to the sealing faces, and the sealing faces in the uncompressed state being cylindrical surfaces which extend axially for a distance greater than the height of their respective side walls, such that the land portions, viewed in an axial cross sectional plane are generally rectangular, each sealing face engaging a discrete outer surface of said cable, which discrete cable outer portions are spaced apart axially, by said recesses, from the other discrete outer cable surfaces which are engaged by other land portions, each said land portion engaging said cable around the entire circumference of its said discrete surface,

the land portions being of a resilience, which, upon compression onto and around its respective cable, deforms into its adjacent recesses to form a high pressure fluid tight seal between itself and the cable (1) within a finite range of cable diameters received within that passageway and (2) in the presence of certain common irregularities in the nominal diameter of the cable.

4,919,373

PUSH MOUNT TIE

Jack E. Caveney, Hinsdale, and Jeffery S. Kuzmuk, Lansing, both of Ill., assignors to Panduit Corp.

Continuation-in-part of Ser. No. 98,269, Sep. 18, 1987, abandoned. This application Dec. 29, 1987, Ser. No. 139,528

Int. Cl.[5] B65D 63/00; F16L 3/03

U.S. Cl. 248—74.3 22 Claims

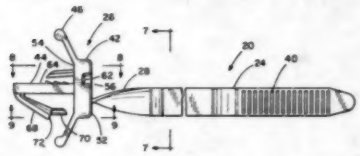
1. A one-piece fastener for securing a plurality of elongate objects in a bundle and securing the bundle to an apertured mounting surface, comprising:

(a) an elongate flexible strap having a plurality of teeth formed along its length in a first planar strap surface;

(b) a head disposed transverse to the planar strap surface having an upper surface and a lower surface, said head having a

strap accepting and positioning slot formed through the thickness thereof;

(c) strap locking means formed on the head for securing a free end of the strap to the head and aperture mounting means formed on the head for securing the fastener within an aperture in the mounting surface; and



(d) a molded spiral strap portion extending from and joining one end of the strap to the upper surface of the head whereby the structural features of the entire fastener can be molded in a conventional, simple two plate mold without side action.

4,919,374

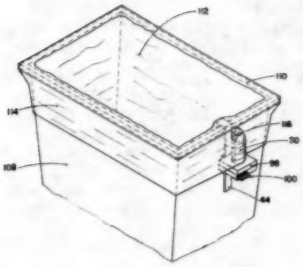
PLASTIC LINER SECURING APPARATUS

Marland R. Julian, Baker, Oreg., assignor to J - MARK Industries, Baker, Oreg.

Continuation-in-part of Ser. No. 103,902, Oct. 2, 1987, abandoned, which is a continuation-in-part of Ser. No. 39,384, Apr. 17, 1987, abandoned. This application Mar. 7, 1988, Ser. No. 164,884

Int. Cl.[5] B65B *7/12*

U.S. Cl. 248—95 **7 Claims**



1. For rigid or semi-rigid waste or storage containers which utilize flexible plastic liners, a plastic liner securing apparatus or device for securing or attaching flexible plastic liners to and holding said liners within said containers by inserting the folded over or turned down portion of the liner top directly into the open split or divided accumulator and rotating the accumulator until the liner is tightened or stretched around the top uppermost portion of the container, said apparatus comprising:

(a) a split or divided accumulator means having two or more elongated vertical portions being spaced apart and being joined together at their bases to form a common base or single base portion

(b) a rotational transmission means which is capable of rotating the split or divided accumulator

(c) a holding releasing means which is capable of holding the split or divided accumulator in a stationary position for indefinite periods and allowing the split or divided accumulator to be counter rotated

(d) a housing means which supports the split or divided accumulator and houses, supports, or contains, the rotational transmission means, and the holding releasing means

(e) said housing means is attached to or is an integral part of a mounting bracket means which is used to attach the apparatus or device to the waste or storage container.

4,919,375

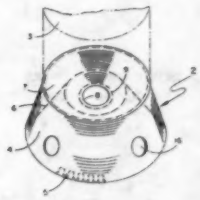
SUPPORT STRUCTURE FOR A FLUID CONTAINER

Steven L. Miller, Shelby County, and Ronald L. Wathen, Jefferson County, both of Ky., assignors to Environmental Water Technology, Inc., Louisville, Ky.

Filed Apr. 5, 1989, Ser. No. 333,263

Int. Cl.[5] A47G *23/02*

U.S. Cl. 248—152 **12 Claims**



1. Support structure for a container comprising:

an outer peripheral skirt member having an upper edge sized to nestingly engage a first preselected peripheral wall portion of a container supported thereby;

an inner peripheral skirt member disposed within said outer skirt member and having an upper edge sized to nestingly engage a second preselected peripheral wall portion of said container inwardly of said first peripheral wall portion of said container said upper edge of said inner peripheral skirt member being horizontally spaced inwardly from said upper edge of said outer peripheral skirt member with said inner peripheral skirt member sloping downwardly and outwardly toward said outer peripheral skirt member with the lower edge of said inner peripheral skirt member extending adjacent to the inner face of said outer peripheral skirt member;

first structural connection means supportively connecting said upper edge of said outer peripheral skirt member to said spaced upper edge of said inner peripheral skirt member; and

second structural connection means connecting said lower edge of said inner peripheral skirt member at a location substantially adjacent said inner face of said outer peripheral skirt member.

4,919,376

COUNTER-BALANCING MECHANISM FOR CAMERA UNIVERSAL HEAD

Kenichi Uehara, Kawagoe, and Hisashi Tomioka, Asaka, both of Japan, assignors to Daiwa Manufacturing Co. Ltd., Tokyo, Japan

Filed Apr. 28, 1989, Ser. No. 344,865

Claims priority, application Japan, Nov. 25, 1988, 63-152494[U]

Int. Cl.[5] F16M *11/10*

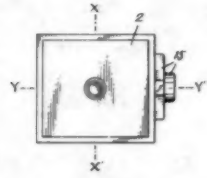
U.S. Cl. 248—185 **2 Claims**

1. A counter-balancing mechanism for a camera universal head journaling to support vertically rotatively in both direction at two axial pieces protrudingly provided in symmetry at the inside of side plates of said head a camera mounting table on a base support formed rotatively in both direction laterally, comprising;

a box-like hollow space provided on said base support to insert a spring receiving seat into said hollow space so as

to make said seat slidable in the direction right angle in a plane to the protruding directions of said axial pieces;

each recessed portion provided on the end surface of each said axial piece to form a cam surface in eccentricity to the center of said piece on the circumferential inner surface of said recessed portion; and



two protruding rollers provided on said spring receiving seat to be made in suppressing contact with said respective cam surfaces by said spring receiving seat energized by a spring therein.

4,919,377

SHEET DISPENSER AND DISPLAY AND HOLDER THEREFOR

Herman P. Alexander, Merrick, and John D. Langwell, Freeport, both of N.Y., assignors to Sandy Alexander, Inc., Clifton, N.J.

Filed Jan. 28, 1988, Ser. No. 149,334

Int. Cl.[5] A47B *96/06*

U.S. Cl. 248—225.1 **22 Claims**

1. A display holder for releasably supporting a pad of sheets in a price channel support having spaced inwardly facing upper and lower flanges, the pad being formed with a pair of spaced apertures therethrough, comprising:

a mounting portion adapted for coupling to the support, the mounting portion being formed with an upper first edge and a lower second projecting edge, the first and second edges of the mounting portion being spaced a distance slightly greater than the spacing between the edges of the channel of the price channel defined by the flanges for receipt therein and positioned in the channel by the flexing the mounting portion toward the channel; and

a pair of laterally spaced prongs formed with enlarged heads and shaped to permit insertion of the prongs through the apertures of said pad for retention of said pad while permitting removal of sheets therefrom, the prongs being flexibly integrally connected to the mounting portion at positions intermediate the upper and lower edges of the mounting portion and depending outside both sides of the lower second edge, said mounting portion and prongs of the holder being integral and formed from flexible sheet material.

4,919,378

SUPPORT STRUCTURE FOR BICYCLE SADDLE

Yoshihisa Iwasaki, Sakai, and Shogo Akamatsu, Izumi, both of Japan, assignors to Maeda Industries, Ltd., Osaka, Japan

Filed Feb. 27, 1989, Ser. No. 315,497

Claims priority, application Japan, Apr. 12, 1988, 63-48983[U]

Int. Cl.[5] A47F *1/10*

U.S. Cl. 248—295.1 **12 Claims**

1. A support structure for a bicycle saddle comprising:

a first seat post mountable to a seat pipe of a bicycle frame, said first seat post being provided at an upper portion thereof with a post support portion having a mounting bore which extends obliquely upwardly and forwardly of the bicycle,

a second seat post for supporting said saddle, said second seat post having a slide portion which is slidably fitted in said mounting bore and extends at an angle to said first seat post; and

a lock mechanism for locking said second seat post at an adjusted position relative to said mounting bore.

4,919,379

UNIVERSAL CLAMPING FIXTURE FOR BABY CARRIAGE UMBRELLAS

Kurt A. Goetz, Aumuehle Container Terminal, D-8700 Wurzburg, Fed. Rep. of Germany

Filed Feb. 7, 1989, Ser. No. 307,774

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1988, 8808262

Int. Cl.[5] A44B *21/00*

U.S. Cl. 248—231.6 **7 Claims**

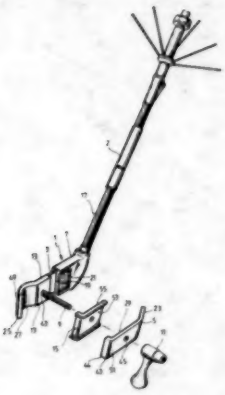
1. A universal clamping fixture for baby carriages, comprising:

a clamp body attachable to one end of a shaft;

a stationary clamp jaw having a hole therethrough, a first end, a second end, a clamping surface, and a second surface, the first end being attached to the clamp body and the second end being adapted to interchangeably receive members of round, square or rectangular cross section with equal facility and to transmit approximately equal clamping stresses to members having round, square or rectangular cross sections;

a movable clamp jaw having a hole therethrough, a first end, a second end, a clamping surface, and a second surface, the first end being angled to contact one side of the clamp body and the second end has a flat clamping surface, a retaining lip perpendicular to the flat clamping surface, and an arcuate depression in the flat clamping surface spaced from the retaining lip, said second end being adapted to interchangeably receive members of round, square or rectangular cross section with equal facility, and to transmit approximately equal clamping stresses to members having round, square or rectangular cross sections, and wherein said clamp body includes a depression

therein, said first end of said movable clamp jaw engages an edge of said depression so as to pivot thereabout; and



means for urging the movable clamp jaw toward the stationary clamp jaw.

4,919,380

ROTATIONALLY AND TRANSLATIONALLY PIVOTABLE BALANCING ASSEMBLY

Ralph L. Ely, Jr., Durham, N.C., assignor to Kelyx, Inc., Durham, N.C.

Filed Mar. 15, 1989, Ser. No. 324,251
Int. Cl.[5] A47K *1/08*
U.S. Cl. 248—311.2 **6 Claims**

1. A rotationally and translationally pivotable assembly, comprising:

an elongate member;

a functional element mounted on said elongate member;

a counter-weight mounted on said elongate member in spaced relationship to said functional element; and

a single pivotal structure comprising (i) a single omnidirectional fulcrum with a base structure reposable on a support surface for areal contact therewith, and (ii) a support arm joined to said elongate member and operatively associated with said omnidirectional fulcrum to permit rotational and translational pivoting movement of said elongate member, and

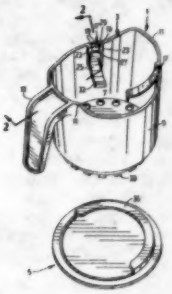
wherein said functional element comprises a beverage container holder secured to an upper part of said elongate member, said elongate member having joined at said upper part thereof a laterally extending support arm, wherein the beverage container holder is secured to the upper part of the elongate member below the laterally extending support arm.

4,919,381

CUP HOLDER

Ronald W. Buist, 1284 Avon Crescent, Oakville, Ontario, Canada (L6J 2T6)

Filed Feb. 9, 1989, Ser. No. 308,222
Int. Cl.[5] A47J *47/16*
U.S. Cl. 248—154 **16 Claims**



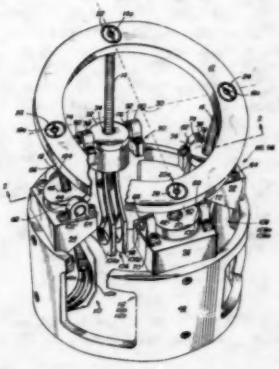
1. A cup holder for holding a cup, comprising a cup retainer including a wall dimensioned to loosely receive the cup and at least one resilient tab projecting inwardly from the wall for resiliently gripping the cup, the cup retainer further including a respective slot in the wall for each tab, each slot having substantially vertical sides and a sill and for each slot, the wall having a pair of opposing, spaced apart, L-shaped brackets providing an opening, the wall being indented between the brackets to form the slot.

4,919,382

MULTI-POST YOKE GIMBAL

Donald B. Forman, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 14, 1988, Ser. No. 244,363
Int. Cl.[5] B25J *17/02*
U.S. Cl. 248—178 **12 Claims**



1. A multi-post gimbal mechanism for imparting motion to an object about a center of rotation comprising:

a frame for supporting said object;

a plurality of elongate posts, each coupled to said support frame at a coupling point so as to permit orbital rotation of

said frame about each said coupling point, each of said elongate posts being selectively adjustable in position;

drive means coupled to said plurality of elongate posts for selectively adjusting the position of each of said elongate posts;

a mounting base, said drive means being connected to said mounting base;

each of said elongate posts including a first end and a second end, each said first end being connected at said coupling point; and

said mounting base including a plurality of arcuate guides connected thereto, the second end of each of said elongate posts being positioned in one of said plurality of arcuate guides.

4,919,383

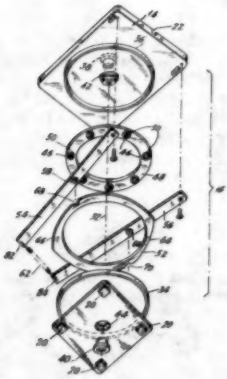
ROTATING DISPLAY

Olivier Benjamin, Woodcliff Lake; Robert P. Franklin, Lake Hopatcong, and John Larocca, Fairfield, all of N.J., assignors to Trans World Marketing Corp., E. Rutherford, N.J.

Filed Mar. 30, 1989, Ser. No. 330,440

Int. Cl.[5] A47B *95/00*

U.S. Cl. 248—349 **15 Claims**



1. A rotation mechanism comprising a turntable rotatably mounted upon a base and free to rotate about an axis of rotation to at least one predetermined equilibrium orientation relative to said base, said base having a cam with a contact surface which is non-uniform about said axis of rotation, said turntable having attached thereto, first and second pressure arms each pivotably mounted to said turntable, wherein first and second cam followers are rotatably mounted to said first and second pressure arms respectively, both cam followers being pressed against said contact surface by a single biasing means and with a force sufficient to cause, in the absence of external force or impediment, an angular acceleration of said turntable, relative to said base, in a direction toward one of said equilibrium orientations.

4,919,384

GUIDING DEVICE FOR A PORTABLE MACHINE

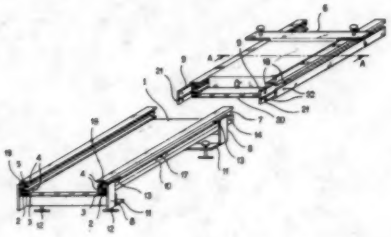
Gerard Grimberg, 28 Rue De Garches, 92210 Saint Cloud, France

Filed Jan. 27, 1989, Ser. No. 302,812

Int. Cl.[5] B27B *9/04*

U.S. Cl. 248—646 **9 Claims**

1. A device for supporting and guiding portable electric machines executing a rectilinear work, such as a cut, a slot, a rabbet, which includes a rectilinear rail (1) of a U-shaped section including two parallel wings (2) and a bottom (3), in which a travelling path (5) receives a mobile carrier (6) adapted for carrying the machine, the rail being fixed on a material (23) to be worked by sliding stirrups (8, 24), in slides on said wings characterized in the rail is made, at least over a



major portion of its perimeter, of a double wall, the two walls being rigidly connected to one another by braces placed in spaces between the two walls so as to form a monolithic structure, non deformable under the efforts generated by the machine in any position.

4,919,385

STRUCTURE TO SUPPORT A LARGE MIRROR, AND A LARGE MIRROR EMPLOYING THAT STRUCTURE

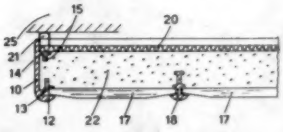
Dino Munini, S. Quirino, and Franco Marcorin, Cinto Caomaggiore, both of Italy, assignors to Imago Flama Sas di Pasquinelli Mauro & C., Pravisdomini, Italy

Filed Mar. 24, 1989, Ser. No. 328,321

Claims priority, application Italy, Apr. 6, 1988, 83362 A/88

Int. Cl.[5] A47F *7/14*

U.S. Cl. 248—475.1 **6 Claims**



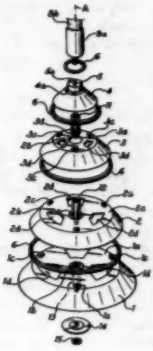
1. A structure for supporting a mirror cabinet, cupboard doors, hanging cupboard doors with mirrors, or two-face partition panels with mirrors or other items, said structure comprising:

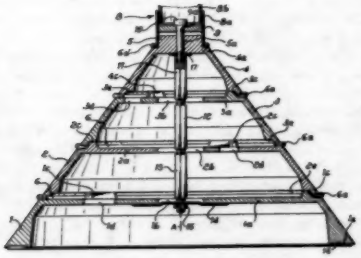
a plurality of lateral sections provided with means for supporting at least one mirror and a rear panel, wherein said lateral sections are joined by means of angular elements cooperating, respectively, with guiding means and with two adjacent lateral sections;

a volume of space being delimited by said lateral sections, at least one said mirror and said rear panel, wherein said lateral sections comprise means for supporting said rear panel, and

an injected foam material means which binds solidly together all the elements forming said mirror cabinet fills up said volume of space.

4,919,386
FOOT FOR TABLE LEG
Franco Cassina, Meda, Italy, assignor to Cassina S.p.A., Meda, Italy
Filed Mar. 10, 1989, Ser. No. 322,558
Claims priority, application Italy, Sep. 13, 1988, 21842/88[U]
Int. Cl.[5] F16M *11/24*
U.S. Cl. 248—544 9 Claims





1. In combination with a leg of a table or the like, a foot comprising:

a stack of similarly upwardly tapered one-piece elements including an upper element, an intermediate element, and a lower element all centered on a common upright axis, the elements each having

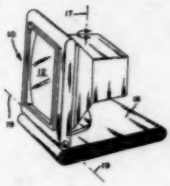
a downwardly flaring skirt having an upper edge and a lower edge and

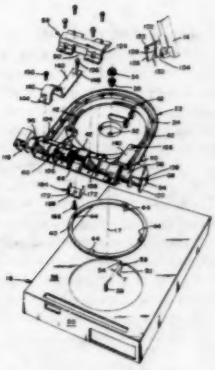
a flat plate bridging the upper edge,

the elements all being substantially free of internal structure beneath the plate and within the skirt but being of sizes decreasing incrementally from the lower element to the upper element, each plate being formed at the axis with a central hole, the lower edges of at least the upper and intermediate elements each forming a downwardly open seat, the plates of at least the lower and intermediate plates being formed offset from the respective central holes with respective upstanding centering formations complementarily engageable in the seats of the respective immediately overlying elements. the upper element having an upwardly directed centering formation fittable with the lower end of the leg to which the foot is to be attached; and

a multipart bolt extending axially through the holes and having an upper end engaged with the lower end of the leg fitted to the foot and a lower end bearing upward on the plate of the lower element.

4,919,387
TILT AND SWIVEL SUPPORT APPARATUS
Craig F. Sampson, Palo Alto, Calif., assignor to Bell & Howell Publication Systems Company, Skokie, Ill.
Filed Mar. 6, 1989, Ser. No. 319,528
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—921 66 Claims





41. Apparatus for adjustably swivelling a product, comprising the combination of:

a swivel member having a plurality of spaced arcuate slots about the same axis of rotation;

a base for supporting said swivel member and for permitting said swivel member to rotate with respect to said base about said axis;

a bearing ring interposed between said swivel member and said base, said swivel member being rotatable about said axis with respect to said ring and said ring being rotatable about said axis with respect to said base, said ring including spaced fingers respectively projecting through said slots for limiting rotatability of said swivel member with respect to said ring to a first predetermined rotational angle about said axis, said ring further including a stop for cooperating with said base for limiting rotatability of said ring with respect to said base to a second predetermined rotational angle about said axis; and

mounting means for mounting the product to said swivel member.

4,919,388

PLASTICS SHAPING MOLD HAVING PATTERNED RESIN LAYER

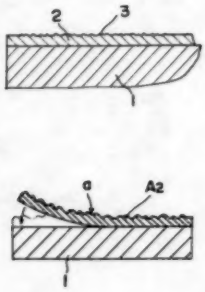
Hiroyuki Koike, Nara; Yukihiro Hata, Osaka, and Mitsushi Sogabe, Moriguchi, all of Japan, assignors to Tanazawa Hakko Sha Co., Ltd., Osaka, Japan

Continuation of Ser. No. 943,107, Dec. 17, 1986, abandoned. This application Sep. 21, 1988, Ser. No. 247,236

Claims priority, application Japan, Dec. 20, 1985, 60-288369; Dec. 20, 1985, 60-288368; Jan. 31, 1986, 61-21074

Int. Cl.[5] **B29C** *33/56*

U.S. Cl. 249—115 **11 Claims**



1. A mold for shaping a plastic material, which comprises a first mold portion and a second mold portion, a hardened resin layer of non-uniform thickness fixedly superposed on at least a pattern-defining portion of said first mold portion and adapted to be in contact with said plastic material, said hardened resin layer on said first mold portion having a pattern defining shaping surface of non-uniform thickness, said pattern defining shaping surface of non-uniform thickness being exposed toward said second mold portion for impressing a pattern defined surface of non-uniform thickness on said plastic material injected between said exposed pattern-defining shaping surface of non-uniform thickness and said second mold portion, said hardened resin layer has a thickness of from about 0.2 mm to about 0.6 mm with said pattern defining surface of non-uniform thickness to be impressed on said plastic material being shallower than said resin layer thickness.

4,919,389

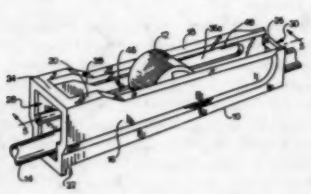
LARGE BORE TUBING ROLLER CLAMP

Mark A. Hoekwater, Mundelein; Anthony R. Paren, Hawthorn Woods; Thomas Kasting, McHenry, and Richard Rollins, Mundelein, all of Ill., assignors to Baxter International Inc., Deerfield, Ill.

Filed Mar. 17, 1989, Ser. No. 324,850

Int. Cl.[5] **F16K** *7/06*

U.S. Cl. 251—6 **6 Claims**



1. A large bore tubing roller clamp assembly for regulating the flow rate of a liquid through large bore tubing, said assembly comprising a substantially rigid elongated plastic frame, a generally cylindrical roller, and a length of a large bore tubing disposed within said frame,

said frame having:

a pair of side walls, a flat bottom wall, and a top wall portion defining an elongated aperture therein, said aperture being defined, in part, by a first bridge member joining said side walls at one end of said frame, and a second bridge member joining said side walls at the opposite end of said frame;

said frame further comprising means defining apertures at each end of said frame for receiving large bore tubing therethrough, wherein the aperture at one end further serves as a roller receiving aperture for receiving said roller therethrough;

said frame further having a roller track comprising a recessed pathway located along the inner surface of each of said side walls beginning from said end defined by said roller receiving aperture and extending substantially along the length of said frame, said roller track being disposed at an incline relative to said flat bottom wall;

said frame still further comprising a loading ramp for loading said roller into said roller track, said loading ramp being defined along the inner surfaces of each of said side walls and below said recessed pathways of said roller track, said loading ramp beginning from the end defined by said roller receiving aperture and extending upwardly to merge with said roller track to facilitate insertion of said roller into said frame;

said roller being disposed within said frame and being rollingly movable along said frame,

said roller having means defining an axle at the center of each face of said roller, said axle means being disposed within the recessed pathways of said roller tracks to permit movement of said roller along of said frame;

a portion of said roller protruding through said aperture of said top wall portion for manual movement of said roller;

said large bore tubing being disposed within said frame between said roller and said flat bottom wall and extending through each of said end apertures, whereby the flow-rate of a liquid therethrough is controlled by moving said roller over said tubing between a fully open position at one end of said roller track and a fully closed position spaced from the other end of said roller track, the flow rate through said tubing being substantially uninhibited when the roller is disposed in said fully open position, said flow rate decreasing as said roller is moved from said one end and gradually compresses tubing, thereby decreasing the fluid pathway through the interior of said tubing, said flow rate being defined by a flow-rate of zero when said roller is in said fully closed position; and

said frame further comprising obstruction means disposed along said roller track at said fully closed position to inhibit movement of said roller beyond said fully closed position, said obstruction means being spaced from the other end of said roller track.

4,919,390

SOLENOID OPERATED VALVE APPARATUS

Ken Ichiryu, Ibaragi; Takashi Kanai, Kashiwa; Masami Ochisi, Atsugi, and Nobuhiko Ichiki, Kashiwa, all of Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1988, Ser. No. 288,096

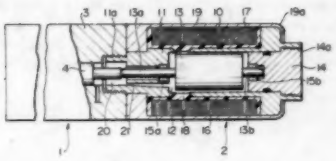
Claims priority, application Japan, Dec. 29, 1987, 62-201503

Int. Cl.[5] **F16K** *31/06*

U.S. Cl. 251—129.15 **4 Claims**

1. A solenoid operated valve apparatus in which a solenoid device includes an inner yoke, a plunger guide disposed in opposed relationship with said inner yoke, a plunger movably accommodated in a space formed between said inner yoke and said plunger guide, a bobbin frame disposed to surround said inner yoke and said plunger guide, a coil wound around said bobbin frame, and an outer yoke disposed to surround said coil, wherein:

said bobbin frame is made of a polymeric material and is connected to said inner yoke and said plunger guide by adhering the bobbin frame with the inner yoke and



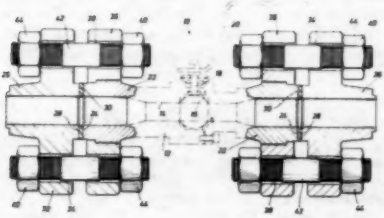
plunger guide to form a unitary structure concurrently with a molding of the bobbin frame, said inner yoke and said plunger guide having inner surfaces which define said space in which said plunger is accommodated.

4,919,391

FLANGED CONNECTION FOR VALVES

Willard E. Kemp, Houston, Tex., assignor to Kemp Development Corporation, Tex.

Filed Oct. 31, 1988, Ser. No. 264,384
Int. Cl.[5] F16K *51/00*
U.S. Cl. 251—148 **12 Claims**



9. In combination with a valve having a valve body defining a valve chamber, an integral end hub, and a flow passage, and a valve member mounted in the chamber for movement between open and closed positions relative to the flow passage; an improved connection for connecting the integral end hub of the valve body to the flange of an associated adjacent flow line; said improved connection comprising:

an annular ring having a central opening therethrough defining an inner circular surface, said inner circular surface having an end portion thereof adjacent the valve member formed with internal screw threads and an opposed end portion thereof remote from the valve member formed with an inwardly extending flange projecting radially inwardly beyond said threaded end portion and exposed externally of the valve body, said inwardly extending flange defining an annular shoulder facing in a direction toward the valve member and a smooth inner surface at right angles to said shoulder;

the integral end hub of the valve body having an end portion thereof adjacent the valve member formed with external screw threads in mating threaded engagement with the internal screw threads of said annular ring and an opposed end portion remote from the valve member defining a smooth outer surface recessed radially inwardly of the adjacent threaded end portion, said inwardly recessed end portion defining an annular shoulder in opposed facing relation to said shoulder on said ring and adapted to abut said ring shoulder for selectively positioning said ring relative to said hub, said ring and said flow line flange having axially aligned openings therethrough;

sealing means between the flange of the adjacent flow line and the valve body about the flow passage of the valve body preventing fluid leakage thereat; and

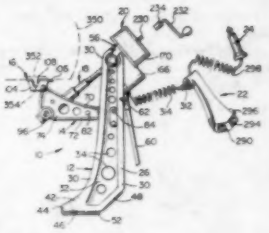
fasteners received within said aligned openings for connecting said end hub of the valve body to the adjacent flow line.

4,919,392

VEHICLE JACK

Paul G. Minuto, 66 Mount Pleasant, P.O. Box 1004, Hudson, Quebec, J0P 1H0, Canada

Filed Dec. 5, 1988, Ser. No. 279,520
Int. Cl.[5] B66F *3/12*
U.S. Cl. 254—126 **8 Claims**



1. A cantilever vehicle jack comprising:

stand means having an upper end and a lower end, the upper end having laterally spaced legs and open back;

lift arm means having one end pivotably connected to said stand means intermediate the upper and lower ends and moveable between a first position and a second position, said lift arm means having a free end and a vehicle contact plate connected thereto;

lift drive means connected between said stand means and said lift arm means and including first and second housings and an elongate screw operative therebetween, said first housing being elongate and having an end pivotally connected to said lift arm means below the contact plate and between its ends and including thread means for operative cooperation with said screw, said second housing being pivotally connected to the spaced side legs of the upper end of said stand and adapted for pivoting between said legs, said elongate screw having an axis and having one end rotatably but non-translationally connected to said second housing for rotation about the axis, the other end of said screw threadably connected to said first housing;

motor means supported by said second housing and adapted for swinging movement within said spaced legs and back of the upper end, said motor means connectible to said screw one end through gear means in a gear housing also supported by said second housing for swinging movement for selectively causing rotation of said screw in either direction;

whereby selective actuation of said motor means causes rotation of said screw through said gear means and telescopic movement between said screw and said first housing controlling movement of said lift arm between said two positions.

4,919,393

DEEPWATER SUBSEA LOWERING/LIFTING SYSTEM

Dennis E. Calkins, Houston, Tex., assignor to McDermott International, Inc., New Orleans, La.

Division of Ser. No. 150,802, Feb. 1, 1988, Pat. No. 4,838,522.
This application Mar. 3, 1989, Ser. No. 318,287
Int. Cl.[5] B66D *1/36*; B66F *1/00*
U.S. Cl. 254—337 **11 Claims**

1. A lowering/lifting apparatus for intermittently deploying-

/retracting a tensile member in a marine environment comprising:

(a) a support from which an elongated tensile member is suspended generally vertically into open water, said support comprising a deck elevated above the waterline;

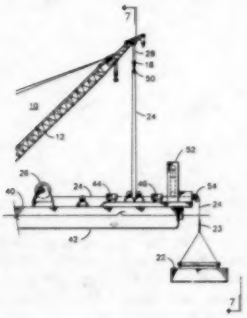
(b) an inboard grip assembly fixedly secured to said deck and configured to grip said tensile member;

(c) an outboard grip assembly fixedly secured to said support and configured to grip said tensile member;

(d) first operating means for selectively and independently operating each said inboard and said outboard grip assemblies to alternately engage or disengage said tensile member thereby alternately seizing or releasing restraint on said tensile member;

(e) a traveling sheave around which said tensile member passes, said sheave being positioned along said tensile member intermediate said inboard and said outboard grip assemblies;

(f) a crane boom for supporting said traveling sheave above said deck;



(g) a fixed block secured at a relatively fixed elevation to an upper region of said crane boom;

(h) a traveling block suspended underneath said fixed block and movable with respect to said fixed block, said traveling sheave being secured to and movable with said traveling block;

(i) a separate cable suspending said traveling block from said fixed block; and,

(j) second operating means for selectively lowering/raising said traveling sheave with respect to said deck so that when said inboard grip assembly engages said tensile member and said outboard grip assembly is disengaged from said tensile member, said tensile member suspended in open water is deployed/retracted with respect to said support upon the lowering/raising of said sheave and, so that when said outboard grip assembly engages said tensile member and said inboard grip assembly is disengaged from said tensile member, said tensile member suspended in open water remains static with respect to said support upon the lowering/raising of said sheave.

4,919,394

RAILING CONSTRUCTION

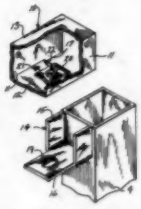
Donald R. Otte, New Berlin, and Steven E. Krueger, New London, both of Wis., assignors to Cubic Designs Inc., Milwaukee, Wis.

Filed Feb. 1, 1989, Ser. No. 304,709

Int. Cl.[5] E04H *17/14*

U.S. Cl. 256—65 **10 Claims**

8. A railing construction, comprising a plurality of upright hollow posts having a generally rectangular cross section, a hollow rail having a generally rectangular cross section connected between adjacent posts, said rail including a pair of opposed side walls, a bottom wall and a top wall, a rail supporting bracket secured to said posts, each bracket including a pair of spaced vertical side members extending outwardly from said post and disposed flatwise against the inner surfaces of the respective side walls of said rail, each bracket also including a horizontal lip extending outwardly from said post and disposed at the lower ends of said side members, said lip having a greater horizontal length than said side members and projecting beyond the outer ends of said side members, said lip being disposed flatwise against the bottom wall of said rail, said bottom wall and said lip having aligned openings, said rail having an end disposed in abutting relation to a surface of a post and having a notch in said bottom wall extending from said end a horizontal distance at least as great as the horizontal length of said side members, said notch being constructed and arranged to receive said side members as the rail is slipped downwardly over the bracket, and connecting means disposed within said aligned openings for connecting said rail to said bracket.



4,919,395

APPARATUS FOR HEAT TREATING A CONTINUOUSLY MOVING METAL WIRE

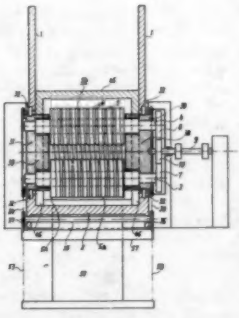
Gerhard Ritter; Klaus Ritter, and Günther Stoisser, all of Graz, Austria, assignors to EVG Entwicklungs-u.Verwertungs-Gesellschaft m.b.H., Styria, Austria

Continuation of Ser. No. 135,342, Dec. 21, 1987, abandoned. This application Mar. 15, 1989, Ser. No. 325,094

Claims priority, application Austria, Jan. 9, 1987, 35/87

Int. Cl.[5] C21D *9/56*

U.S. Cl. 266—103 **14 Claims**



1. Apparatus for heat treating a single continuously moving metal wire in a heat-treatment area, comprising

first and second shafts parallel to each other,

first and second pluralities of discs mounted on said first and second shafts respectively, each disc of said first plurality of discs facing against a corresponding disc of said second plurality of discs, each of said discs having wire-guide grooves thereon, said grooves being arranged for winding a single wire in a helical manner about successive grooves

of successive discs of said first and second pluralities while alternating between said grooves of said first and second pluralities,

said first shaft being a drive shaft,

said second shaft being driven in the same direction as said first shaft,

said first plurality of discs including a first disc being driven by said first shaft, the remainder of said first and second pluralities of discs being freely rotatable on said first and second shafts, and

means for supplying a single wire to said discs.

4,919,396

APPARATUS FOR SMELTING MELTABLE SUBSTANCES, PARTICULARLY ORE CONCENTRATES

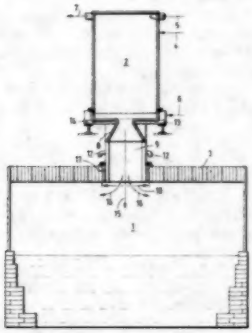
Walter Fritsch, Bergisch Gladbach, and Friedrich Megerle, Köln, both of Fed. Rep. of Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 31, 1988, Ser. No. 238,521

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1987, 3729798

Int. Cl.[5] F27B *15/08*

U.S. Cl. 266—182 **9 Claims**



1. An apparatuus for smelting meltable substances comprising in combination:

a furnace;

a melting cyclone arranged above said furnace out of which a melted mass is discharged into the furance via a discharge opening in the bottom of the cyclone and an opening in the roof of the furnace;

and a transfer element including a vertical pipe connecting the discharge opening of the cyclone discharge to the opening in the roof of the furnace.

4,919,397

STATIONARY INJECTION BLOCK AND INJECTION SLIDE PLATE FOR USE WITH AN INJECTION VALVE

Patrick D. King, Rantoul, Ill., assignor to Flo-Con Systems, Inc., Champaign, Ill.

Division of Ser. No. 53,080, May 22, 1987, Pat. No. 4,771,992, which is a continuation-in-part of Ser. No. 14,999, Feb. 17, 1987, Pat. No. 4,799,649, which is a continuation-in-part of Ser. No. 885,873, Jul. 15, 1986, Pat. No. 4,824,079. This application Apr. 11, 1988, Ser. No. 179,986

The portion of the term of this patent subsequent to Jan. 24, 2006, has been disclaimed.

Int. Cl.[5] C21C *5/48*

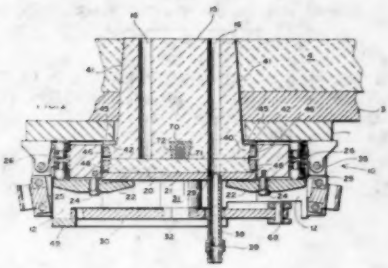
U.S. Cl. 266—267 **11 Claims**

1. A stationary injection block for an injection valve wherein by:

a sliding gate face at one end,

a vessel face at the opposite end,

a plurality of orifices through the block and substantially perpendicular to the faces,



an elliptical cross section,

said sidewall tapering in narrowing fashion toward the vessel face.

4,919,398

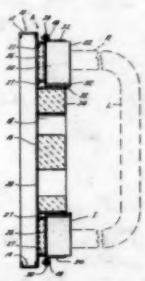
ATTACHMENT STRUCTURE MOUNTINGS FOR REFRACTORY FIBER LADLE PREHEATER SEALING RINGS

Mack A. Hounsel, Houston, Tex., assignor to J T Thorpe Company, Houston, Tex.

Division of Ser. No. 564,745, Dec. 21, 1983, Pat. No. 4,492,382. This application Oct. 29, 1984, Ser. No. 665,926

Int. Cl.[5] F16J *15/02*

U.S. Cl. 266—283 **4 Claims**



1. In a trapezoidal refractory fiber ring insulation unit adapted for mounting with a ladle preheater to seal the rim of the ladle as the ladle is positioned against the ladle preheater, said trapezoidal unit being formed from a plurality of adjacent transverse radial layers of refractory ceramic fiber insulation material having intermediate portions mounted in planes extending radially outwardly from a central portion of the ladle as the ladle is so positioned, attachment structure for mounting said insulation unit with the ladle preheater, said attachment structure comprising:

(a) mounting rod means extending transversely through said plurality of transverse layers in said intermediate portions thereof; and

(b) means for connecting said mounting support rod means to the preheater, comprising:

(1) a support channel having openings therein for receiving said mounting support rod means therein; and

(2) means for attaching said support channel to the preheater; and

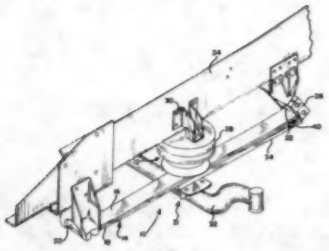
(c) a slide channel member movably mounted with said support channel for relative radial movement in the direction of said layers to resist tearing of the fiber insulating material by said support rod means during installation.

4,919,399

SUSPENSION BRAKE TORQUE REACTION LEAF

Robert J. Selzer, and Noel E. Leitzman, both of Fort Wayne, Ind., assignors to Navistar International Transportation Corp., Chicago, Ill.

Filed Apr. 10, 1989, Ser. No. 335,629
Int. Cl.[5] B60G *11/02*
U.S. Cl. 267—31 **12 Claims**



1. In combination with a leaf spring suspension system including leaf spring means comprising at least one leaf having its ends joined to a vehicle frame and to an axle of the vehicle at an approximate center point thereof so as to extend forwardly and rearwardly of said axle approximately equally, a brake torque reaction member for preventing excessive stress from building up during braking comprising a planar elongate member anchored at one end thereof between said axle and said centerpoint of said spring assembly and extending rearwardly therefrom in cantilever fashion to an unsupported end, said unsupported end being disposed to engage said leaf spring means only upon imposition of braking torque on said axle, wherein said brake torque reaction member does not aid in vertical suspension.

4,919,400

VIBRATION ISOLATOR OF BUSHING TYPE WITH LIQUID CHAMBERS AN ELASTIC BODY

Toshiyuki Tabata, Sagamihara, and Tatsuro Ishiyama, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Bridgestone Corporation, Tokyo, both of, Japan

Filed Jan. 12, 1989, Ser. No. 296,018
Claims priority, application Japan, Jan. 12, 1988, 63-4374
Int. Cl.[5] F16F *13/00*
U.S. Cl. 267—140.1 **5 Claims**

1. A vibration isolating device, comprising:

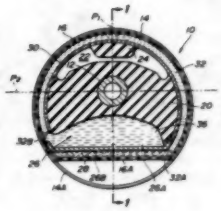
a hollow outer cylinder;

an inner cylinder which has an outer diameter smaller than the inner diameter of the outer cylinder and is disposed in and parallel to the outer cylinder, one of the outer and inner cylinders being formed to be connected with a member which vibrates and the other cylinder being formed to be connected with another membrane which is to be isolated from vibration;

an elastic body which is tightly interposed between the outer and inner cylinders and is formed with a hollow on one side of a plane containing the longitudinal axis of the inner cylinder and a radially inner first liquid chamber and a radially outer second liquid chamber on the opposite sid of said plane;

means for defining a flow restrictive passage which connect said first and second liquid chambers to each other;

a tubular elastic membrane which is tightly bonded by vul canization to the inner surface of said outer cylinder anc partly has a radially inwardly dented part such that the dented part serves as a flexible diaphragm defining the



radially outer periphery of said second liquid chamber, the cylindrical wall of said outer cylinder being formed with an opening in a region where said elastic membrane is used as said diaphragm such that said opening occupies an area opposite to the entire area of said dented part of said tubular elastic membrane; and

an incompressible liquid filled into said first and second liquid chambers and said flow restrictive passage.

4,919,401

FLUID-FILLED BUSHING HAVING RADIALLY DISPLACEABLE INTERMEDIATE SLEEVE COATED WITH SEALING RUBBER LAYER

Katsuhisa Yano, Inuyama, Japan, assignor to Tokai Rubber Industries, Ltd., Japan

Filed Feb. 2, 1989, Ser. No. 305,084
Claims priority, application Japan, Feb. 8, 1988, 63-15424[U]
Int. Cl.[5] F16F *5/00*; F16M *5/00*
U.S. Cl. 267—140.1 **5 Claims**

1. A fluid-filled elastic bushing, including (a) an inner sleeve, (b) an intermediate sleeve disposed radially outwardly of an coaxially with the inner sleeve, (c) an elastic rubber body connecting the inner sleeve and the intermediate sleeve and having a plurality of pockets which are exposed through a corresponding plurality of windows formed through the intermediate sleeve, (d) an outer sleeve fitted on the intermediate sleeve and closing the pockets in the rubber elastic body, so as to define a plurality of fluid chambers which are filled with a non-compressible fluid and whose volumes are changed in response to a vibrational load applied between the inner and

outer sleeves in a radial direction thereof, and (e) means for defining an orifice passage for fluid communication between the fluid chambers, wherein the improvement comprises:

the intermediate sleeve having at least one axial slot formed through a thickness thereof so as to extend in an axial direction over an entire axial length thereof, in a portion thereof which does not have said windows, whereby the intermediate sleeve is cut by said at least one axial slot in a circumferential direction thereof;

the elastic rubber body having an axial cutout formed in an outer surface thereof so as to extend in an axial direction thereof over an entire axial length thereof, in a portion thereof aligned with each of said at least one axial slot in the intermediate sleeve, the rubber elastic body having portions for preventing fluid communication between the fluid chambers and the axial cutout;

a sealing rubber layer formed on an outer surface of the intermediate sleeve, the sealing rubber layer being formed integrally with the elastic rubber body, and cut by said axial cutout in a circumferential direction thereof; and

the intermediate sleeve being radially inwardly deformed by a force applied by the outer sleeve, whereby the elastic rubber body and the sealing rubber layer concurrently are radially inwardly pre-compressed.

4,919,402

VIBRATION DAMPING DEVICE UTILIZING ELECTRORHEOPECTIC FLUID

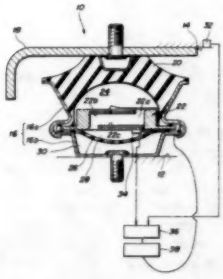
Kazuhiro Doi, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Jun. 12, 1989, Ser. No. 365,260

Claims priority, application Japan, Jun. 13, 1988, 63-145092

Int. Cl.[5] F16F *15/04*; B60K *5/12*

U.S. Cl. 267—140.1 **4 Claims**



1. A method of operating a vibration damping device having a housing in which main and auxiliary chambers are defined, and an orifice passage which interconnects the main and auxiliary chambers and in which electrodes are disposed, comprising the steps of:

sensing the acceleration caused by a vibration which is applied to said damping device;

sensing a pressure which is indicative of the pressure prevailing in said auxiliary chamber; and

controlling the impression of a voltage on said electrodes in accordance with the product of said acceleration and said pressure.

4,919,403

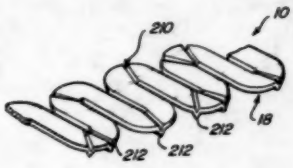
SERPENTINE STRIP SPRING

Donald D. Bartholomew, Marine City, Mich., assignor to Proprietary Technology, Inc., Southfield, Mich.

Continuation-in-part of Ser. No. 916,155, Oct. 7, 1986, abandoned. This application Jul. 12, 1988, Ser. No. 218,102

Int. Cl.[5] F16F *1/02*

U.S. Cl. 267—165 **18 Claims**



1. A spring comprising:

a substantially flat, elongated, strip of material having a thickness with a sufficiently large modulus of elasticity or stiffness including a resilient serpentine biasing portion integrally formed in said elongated strip, said resilient serpentine biasing portion comprised of a plurality of interconnected unitary U-shaped members having a pair of legs connected by a curved web, each alternating U-shaped member being inverted with respect to its adjacent U-shaped members, an elongated slot formed between the legs of each U-shaped member, said elongated slot extending from a lateral edge of the strip past the longitudinal axis of the strip, said resilient serpentine biasing portion enabling axial deflection along the elongated axis of said spring, said resilient serpentine biasing portion U-shaped members having an overall rectangular cross-section with a substantially constant thickness resiliently deflecting in a first direction along said elongated axis in response to a force applied on said strip and resiliently deflecting in a second direction along said thickness of said cross-section in response to continued force applied on said strip and one or more discontinuities in said resilient serpentine biasing portion for controlling said resilient deflection in said second direction, said discontinuities formed by at least one indentation along said thickness positioned substantially on at least one web portion, said strip returns to its original nondeflected position upon removal of said force.

4,919,404

LEAF SPRING ATTACHMENT

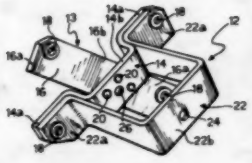
Franco Santini, Fiero, Italy, assignor to Iveco Fiat S.p.A., Turin, Italy

Filed May 11, 1989, Ser. No. 350,285

Claims priority, application Italy, May 16, 1988, 53154/88[U]

Int. Cl.[5] F16F *1/26*

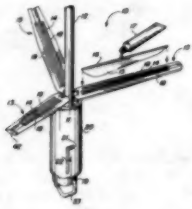
U.S. Cl. 267—260 **6 Claims**



1. A leaf spring attachment of the type comprising a support and an omega-shaped bracket fixed to the support so as to

define two facing walls between which a pin for the eye of the spring is mounted, wherein the support comprises first and second metal strips joined together centrally in an X arrangement and having ends adapted for fixing to the structure of the vehicle.

4,919,405
FLETCHING TOOL
Merineth S. York, 639 S. Elm St., Mesa, Ariz. 85202
Filed Mar. 20, 1989, Ser. No. 325,904
Int. Cl.[5] B25B *1/20*
U.S. Cl. 269—38 **16 Claims**

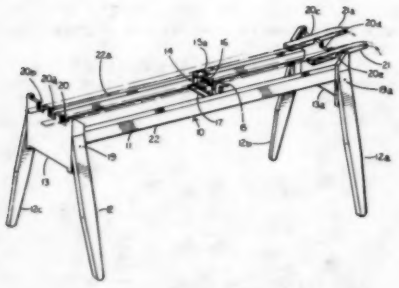


1. In a fletching tool, for precisely aligning and adhering fletching to an arrow shaft, comprising spool means for matingly receiving an arrow shaft preparatory to affixing fletching thereto, a plurality of fletching guides splayably coupled to said spool and being splayable away from an arrow shaft mated with said spool upon initiation and completion of a fletching operation and embracingly encompassing an arrow shaft while fletchir.g is adhered to the arrow shaft, the improvement comprising:

closure means coupled to said spool means for compressively loading the embrace of said fletching about an arrow shaft adjacent said spool means; and

said spool means further comprises arrow nock engaging-/aligning means coupled internal to said spool means.

4,919,406
SKI SUPPORT AND ATTACHMENT MEANS
Dean E. Bunnell, R.R. #1, Box 63, Canaan, Vt. 05903
Filed Jul. 17, 1989, Ser. No. 380,488
Int. Cl.[5] B23Q *3/00*
U.S. Cl. 269—43 **7 Claims**



1. A ski support and attachment means, for providing a platform for waxing, scraping and otherwise maintaining the sliding surface of skis as well as providing a handy carrier for skis, comprising:

a horizontal support frame;

said horizontal support frame having a plurality of vertical support means;

said vertical support means having connection means to said horizontal support frame for permitting rotation of said vertical support means;

said horizontal support frame having twin vertical ski supports fastened at opposite ends of said horizontal support frame;

said ski supports having a plurality of recesses located therein;

a ski binding attachment base located at the midpoint of said horizontal support frame;

said ski binding attachment base comprising a plurality of immovable vertical extensions;

said immovable vertical extensions having twin rigid u-shaped connection means attached thereto;

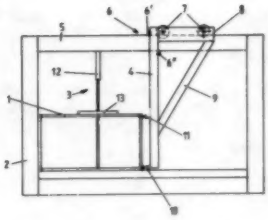
said vertical extensions further having a center rigid angled extension brace;

said ski binding attachment base having base anchoring means;

said ski binding attachment base further having means for replaceable connection to said base anchoring means; and

ski tip support means.

4,919,407
APPARATUS FOR GRIPPING FRAMES
Jacques Valdenaire, La Bresse, France, assignor to Martival S.A., Le Thillot, France
Filed Feb. 21, 1989, Ser. No. 313,364
Claims priority, application France, Feb. 18, 1988, 88 02100
Int. Cl.[5] B25B *5/14*
U.S. Cl. 269—118 **5 Claims**



1. Apparatus for gripping members (1), comprising a construction (2) for reception of the members (1), said construction having mounted thereon means (3) for gripping horizontal edges of said members (1) and means (4) for gripping vertical edges of said members comprising an arm, said construction (2) having an upper beam (5), roller means (7) supporting said arm on said upper beam (5) for rolling movement on said upper beam (5) toward and away from said members (1), and two abutments (6', 6") carried by said arm and so disposed on opposite sides of said upper beam as to grip said upper beam when said arm presses against said members (1) thereby to lock said arm to said upper beam (5), said roller means (7) being so disposed that when said arm rests on said rollers out of contact with said members (1), said abutments (6', 6") release said upper beam (5) thereby to permit free rolling movement of said arm on said upper beam (5).

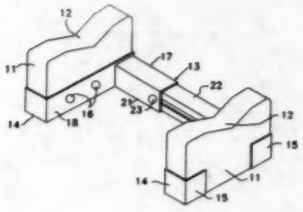
4,919,408
CRANKSHAFT STAND
Dennis M. Muir, 150 John St., Monterey, Calif. 93940
Filed Mar. 30, 1989, Ser. No. 330,500
Int. Cl.[5] B66F *5/04*
U.S. Cl. 269—296 **4 Claims**

1. An adjustable stand for supporting a crankshaft, comprising:

two equal supports, each support having a V-shaped notch for supporting a region of the shaft of a crankshaft, the V-shaped notch permitting free rotation of the shaft while resting in the notch;

an adjustable frame, the frame defining two arms connected by a perpendicularly mounted connecting bar disposed between and at the ends of the two arms, the connecting bar being of adjustable length to permit alteration of the distance between the two arms;

each of the two arms defining two ends having brackets for holding a support against the arm, each bracket having an



extension to prevent the support from falling out of the frame arm, each arm further having at least one hole for receiving a screw to further connect the support to the frame arm;

the connecting bar defining a telescoped inner bar disposed within an outer bar, the inner bar having a longitudinally disposed slot; and

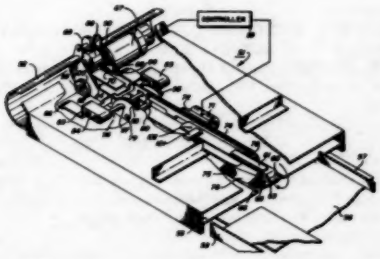
a threaded screw and nut for securing the positions of the inner and outer bars, the screw fitting through a threaded opening in the outer bar and passing through the slot in the inner bar, the nut frictionally engaging with the inner bar.

4,919,409

SHEET HANDLING APPARATUS WITH NARROW BELT HAVING RAISED FRICTIONAL CONTACT ELEMENT

Denis J. Stemmle, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 3, 1986, Ser. No. 882,120
Int. Cl.[5] B65H *3/04, 5/02, 9/04*
U.S. Cl. 271—34 **15 Claims**



1. Sheet handling apparatus for transporting, registering and deskewing sheets comprising a flat surface having inboard and outboard ends across which sheets may be transported, a registration stop member at the outboard end of said flat surface,

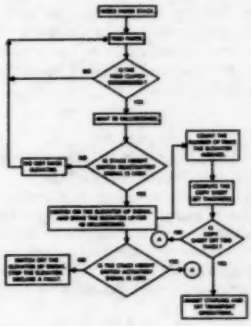
a single endless narrow width belt movably supported around at least two support means to define a belt transport run across and parallel to said flat surface, said single narrow width belt having at least one raised frictional contact element on its outer run for frictional transporting engagement with a sheet to be transported across said flat surface toward said registration stop member, said at least one raised frictional contact element on said belt having a frictional contact area very small relative to the size of the sheet to be transported to minimize frictional forces which inhibit sheet deskewing while being sufficient to provide a friction drive force to drive a sheet across the flat surface and being positioned such that a sheet being transported across said flat surface toward said registration member is transported by only one of said at least one frictional contact element thereby providing a single pivot about which a sheet may pivot when it reaches the registration stop member to be deskewed.

4,919,410

APPARATUS FOR DETERMINING COPY SHEET SET THICKNESS

Norman D. Robinson, Jr., Rochester, and Michael E. Farrell, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 10, 1988, Ser. No. 192,074
Int. Cl.[5] B65H *3/04*
U.S. Cl. 271—34 **20 Claims**



14. A method of determining the thickness of a set of copy sheets used in an electrophotographic printing machine having a plurality of processing stations to reproduce a set of original documents, including the steps of:

supporting a stack of copy sheets on a tray;

advancing successive copy sheets from the stack of copy sheets on the tray to the processing stations of the printing machine to form the set of copy sheets;

indexing periodically the tray a preselected distance each time the thickness of the stack of copy sheets decreases by a specified amount; and

calculating the approximate thickness of the set of copy sheets as a function of the number of times the tray is indexed and a constant corresponding to the preselected distance the tray indexes.

4,919,411

PAPER FEEDING DEVICE

Theodorus M. Ceelen, LaVerne, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 10, 1987, Ser. No. 71,826
Int. Cl.[5] B65H *3/52, 3/04*
U.S. Cl. 271—35 **4 Claims**

1. A paper feeding mechanism for feeding one sheet from a stack of sheets comprising:

a flat surface,

forward and rear rollers positioned forward and to the rear of said flat surface,

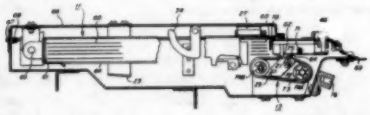
a continuous belt adapted to be driven continuously forward

across said surface and around said rollers, said belt and rollers positioned in relation to said stack so that a forward edge of the first sheet in said stack is in contact with a rear portion of said belt adjacent said rear roller,

means for biasing a forward edge of said stack against said belt, to feed one or several sheets forward,

means adjacent said flat surface for pressing said one or several sheets against said belt, and

a stop immediately forward of said means for pressing com-



prising an edge adjacent and parallel to said flat surface defining a gap between said edge and said belt, the size of said gap being between one and two sheet widths, to prevent more than one sheet from passing through said gap, and

wherein said stop edge is rounded into an arc as viewed from the rear to create said gap that is wider at the edges of the belt than at the center of the belt to compensate for mechanical misalignments that result in said edge not being perfectly parallel to said belt.

4,919,412

CONTROL SYSTEM FOR A DRAW-OFF SYSTEM FOR SHEET MATERIAL

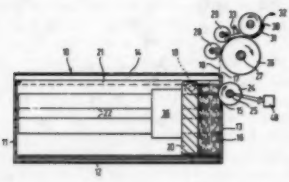
Peter Weigel, Borchen-Doerenhagen; Guenter Holland-Letz, Paderborn-Elsen; Heinz Ademmer, Geseke, and Ulrich Nottelmann, Bad Driburg, all of Fed. Rep. of Germany, assignors to Nixdorf Computer AG, Paderborn, Fed. Rep. of Germany

Filed Feb. 29, 1988, Ser. No. 161,692

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1987, 3706810

Int. Cl.[5] B65H *7/08*

U.S. Cl. 271—110 **14 Claims**



1. For use in a system for drawing off sheets of materials from a stack thereof, of the type including a pressing device for pressing the stack of sheets against a roller system which successively draws of individual sheets from the stack and feeds each sheet to a conveyance path, an improved method of controlling the force applied to the stack of sheets by the pressing device, comprising the steps of:

(A) measuring the time period required to draw-off a sheet for a fixed predetermined distance from said stack during a draw-off operation by said roller system;

(B) comparing the time period measured in step (A) respectively for two draw-off operations; and

(C) controlling the force applied by said pressing device to said stack of sheets based on the comparison performed in step (B), where when the two time periods are equal and compared in step (B), optimum pressure of sheets against the roller system occurs and the force applied by the pressing device remains constant.

4,919,413

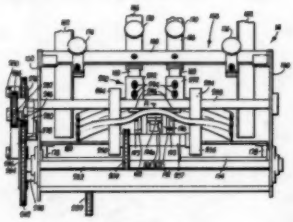
NEWSPAPER HANDLING AND COLLATING METHOD AND APPARATUS

Charles N. Hannon, Olathe, Kans., assignor to Stepper, Inc., Olathe, Kans.

Division of Ser. No. 842,535, Mar. 31, 1986, abandoned. This application Aug. 23, 1988, Ser. No. 235,209

Int. Cl.[5] B65H *3/46*

U.S. Cl. 271—133 **9 Claims**



7. In a method of handling a plurality of normally flat, multi-section, floppy newspapers each having a folded outer section with a transverse fold line along one extremity of said newspaper and a plurality of inner sections being tucked within said outer section, an improved method of metering newspapers from a stack thereof comprising the steps of:

(a) supporting newspapers in an upright stack thereof;

(b) confining all but the lowermost newspaper in the stack thereof against movement transversely of the stack along a feeding path for removal from said stack;

(c) moving said lowermost newspaper along said feeding path and concurrently forming at least one elongated ridge therein which extends from said fold line to an opposite extremity of said newspaper and thereby causes separation of said lowermost newspaper from the one above it; and

(d) engaging said lowermost newspaper in a clamping relationship at locations spaced rearwardly of a leading portion thereof, laterally of said elongated ridge formed therein and below the ridge for augmenting separation of said lowermost newspaper from one above it and causing ejection of said lowermost newspaper from said stack.

4,919,414

HANDLING, INCLUDING SQUARING, OF CONVEYED SHINGLED SHEETS

Carl R. Marschke; Richard H. Thomas, and William D. Wendorf, all of Phillips, Wis., assignors to Marquip, Inc., Pillips, Wis.

Filed Sep. 29, 1988, Ser. No. 251,121

Int. Cl.[5] B65H *29/22*

U.S. Cl. 271—227 **11 Claims**

11. A method for handling and squaring traveling sheets of paperboard or the like and wherein said sheets tend to be skewed out of line, comprising the steps of:

(a) providing

(1) a conveyor (19) for transporting said sheets (6) longitudinally in an upstream-to-downstream direction,

(2) first and second transversely opposed carriages (24,23) disposed respectively on each side of said conveyor,

(3) first and second motive means (35,34) connected to drive said respective first and second carriages transversely of said conveyor between outer and inner positions,

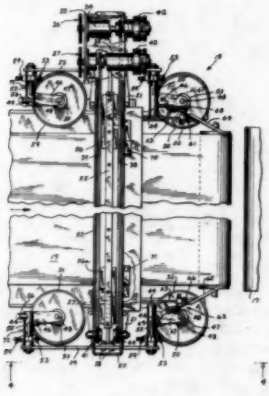
(4) an upstream and downstream sheet tamping wheel (29–32) mounted on each of said carriages,

(5) and first and second sheet sensing means (62,61) mounted on said respective first and second carriages

adjacent a respective downstream tamping wheel (32,30),

(b) causing said first and second motive means to initially drive said carriages approachingly transversely inwardly in a traveling mode toward a skewed sheet in response to said first and second sheet sensing means,

(c) deactivating said first motive means (35) upon sensing of a sheet edge by said first sheet sensing means (62) to thereby stop travel of said first carriage (24) and so that the latter's downstream sheet tamping wheel (32) is spaced a given distance from one sheet edge,



(d) subsequently deactivating said second motive means (34) after stopping of said first carriage and upon sensing of the other sheet edge by said second sheet sensing means (61) to thereby stop travel of said second carriage (23), and so that the latter's downstream sheet tamping wheel (30) is spaced from the said other sheet edge a distance essentially equal to said given distance,

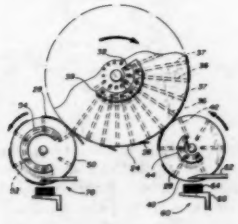
(e) and thereafter re-activating both said first and second motive means (35,34) to thereby bring said downstream tamping wheels (32,30) into squaring engagement with the sheet.

4,919,415

MULTIPLE DELIVERY SYSTEM

David A. Smith, Midland, and Clark M. Woody, Bay City, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 23, 1988, Ser. No. 159,133
Int. Cl.[5] B65H 29/24
U.S. Cl. 271—284 9 Claims



1. A high speed product delivery system comprising:

means for providing a series of individual flexible web products sequentially to a plurality of transfer points, said providing means including a vacuum product drum for conveying said individual products to each of said plurality of transfer points, means for rotating said drum, said vacuum product drum including a plurality of vacuum ports for securing a plurality of said individual products to said vacuum product drum during rotation thereof,

means for transferring individual ones of said products from each of said plurality of transfer points to a plurality of delivery points, said transfer means including a plurality of vacuum transfer drums, means for rotating said drums, said drums arranged such that the first of said plurality of transfer drums accepts products from said product drum at a first transfer point and each succeeding transfer drum accepts individual products from said vacuum product drum at each succeeding transfer point, said first transfer drum delivering at least a portion of said individual products to a first delivery point, and each succeeding transfer drum located at each succeeding transfer point delivering at least a portion of said individual products to succeeding delivery points, and

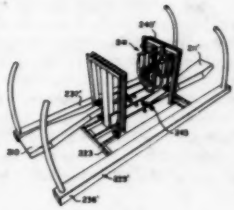
packing devices located adjacent each of said delivery points for removing said flexible products from said vacuum transfer drum, said packing devices including orbital packing fingers to contact and remove said flexible products.

4,919,416

DUAL FACING AEROBIC EXERCISE MACHINE

Richard J. DeCloux, 1485 Belmont St., Manchester, N.H. 03104

Filed Feb. 14, 1989, Ser. No. 311,079
Int. Cl.[5] A63B 23/06
U.S. Cl. 272—69 3 Claims



1. A dual facing stair climbing exercise device having dual facing diametrically opposed exercising position at which users can exercise, said dual facing stair climbing exercise device comprising:

a base having upstanding longitudinally running and centrally located members;

two pairs of reciprocating pivoted stair step lever arms;

means for pivoting said two pairs of stair step lever arms on said base from a central location along the longitudinal length of said base such that each of said pairs of stair step lever arms outwardly extended in opposite directions, wherein said upstanding members having two pairs of apertures therethrough said central location and said

pivoting means in said apertures for pivoting said each pairs of stair step lever arms;

means connected to said base for phasing said pairs of stair step lever arms; and

a pair of spaced apart arcuate hand rails, each end of said arcuate hand rails anchored at said base such that said arcuate hand rails straddle said outwardly extended stair step lever arms to form an extremely stable hand rails and to provide a rigid structure for said dual facing stair climbing exercise device.

4,919,417

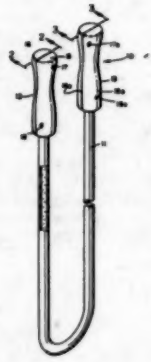
LIQUID FILLED JUMP ROPE

Peter W. Poulas, 59 Bozarthtown Rd., Tabernacle, N.J. 08088

Filed Aug. 15, 1988, Ser. No. 231,947

Int. Cl.[5] A63B *5/20*

U.S. Cl. 272—75 **3 Claims**



1. A jump rope comprising an elongate flexible tube of liquid impervious material, a quantity of water in said tube, an end closure sealing each end of said tube, a handle surrounding each tube end and interfitting with the adjacent end closure for securement of the received tube end, each of said handles comprising an elongate body having a bore extending longitudinally inwardly from one end, said bores each receiving one end of said tube, each bore terminating at its inner end in an enlarged chamber with an inwardly facing shoulder, each end closure including a flange in abutting engagement with the inwardly facing shoulder for tube retention in said handles, each end closure comprising a plug secured in a respective end of said tube, each plug having a lip constituting the flange of the end closure in abutting engagement with the inwardly facing shoulder, access means on one of said handles for access to the adjacent end closure, valve means on said adjacent end closure for introducing and removing water with respect to said tube.

4,919,418

COMPUTERIZED DRIVE MECHANISM FOR EXERCISE, PHYSICAL THERAPY AND REHABILITATION

Jan W. Miller, 725 N. Hite Ave., Louisville, Ky. 40206

Continuation-in-part of Ser. No. 148,881, Jan. 27, 1988, abandoned. This application Apr. 24, 1989, Ser. No. 342,015

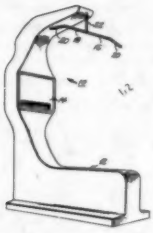
Int. Cl.[5] A63B *21/24*

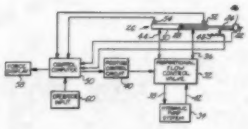
U.S. Cl. 272—129 **18 Claims**

1. In an exercise apparatus having a linearly extendable and retractable flexible tension transmitting device having a first end to which force may be applied by a user and a second end, a movement control system for connection to the second end of the flexible tension transmitting device comprising:

control means including a power driven linear actuator operably connected to the second end of the flexible tension transmitting device;

said control means regulating the extension of the second end of the flexible tension transmitting device to a first constant velocity;





said control means regulating the retraction of the second end of the flexible tension transmitting device to a second constant velocity; and

force measuring equipment operably connected to said control means to measure the force applied to the flexible tension transmitting device.

4,919,419

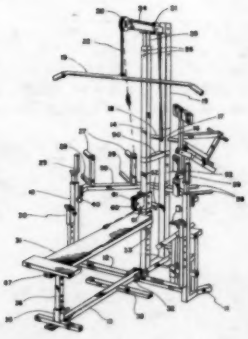
EXERCISE APPARATUS

Stepher R. Houston, Gaithersburg, Md., assignor to Magnaflex Associates Limited, Gaithersburg, Md.

Continuation of Ser. No. 130,604, Dec. 9, 1987, abandoned, which is a continuation-in-part of Ser. No. 88,425, Aug. 24, 1987, abandoned. This application Nov. 7, 1988, Ser. No. 270,449

Int. Cl.[5] A63B *21/00*

U.S. Cl. 272—134 **1 Claim**



1. An adjustable exercise device comprising a horizontal stand adapted and constructed to abut on a floor, said stand having an elongated horizontal longer piece and an elongated horizontal shorter piece at right angles to each other and together having a cruciform configuration, said longer piece having a first upright extending upwardly from one end of said longer piece, a second upright extending upwardly from said longer piece parallel and displaced from said first upright, said first upright and second upright having a brace means therebe-

tween, a third upright extending upwardly from the other end of said longer piece, said third upright being adjustable in height and terminating in a removable bracket, an adjustable bench means positioned between said second upright and said third upright, and further extending over said bracket and hingedly attached thereto, said second upright being fitted with a vertical slide means, said second upright having a plurality of equi-spaced apertures, said apertures extending above and below the terminating end of said third upright, said vertical slide means having pin means adapted and constructed to releasably engage a selected aperture to thereby select a desired vertical position for said vertical slide means, said bench having an elongated tubular member mounted therinunder, an elongated member having a free end adapted and constructed to slide telescopingly into said elongated tubular member, said elongated member having its outer end releasibly and hingedly attached to said slide whereby said bench means may be positioned in the horizontal position, the incline position or the decline position and may be disengaged from the second upright and raised to a vertical position all as desired.

4,919,420

GRIP OF A GOLF CLUB AND A MANUFACTURING METHOD THEREOF

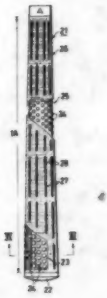
Koji Sato, Tokyo, Japan, assignor to Daiwa Golf Co., Ltd., Tokyo, Japan

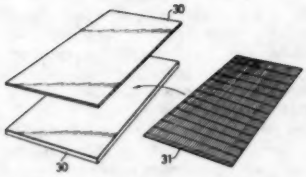
Filed Aug. 24, 1988, Ser. No. 235,992

Claims priority, application Japan, Aug. 28, 1987, 62-132076; Aug. 29, 1987, 62-15838

Int. Cl.[5] A63B *53/14*; B32B *31/00*

U.S. Cl. 273—81 B **2 Claims**





2. A golf club grip having an outer surface and characterized by being provided with an area having a plurality of projections which touch the grip grasping hand in the palm area of the respective bases of the middle finger, the ring finger and the little finger, and inwardly of the base of the little finger, and an area having a plurality of plane portions in the area where the fingers of the whip hand abut the grip, said grip being comprised of a soft synthetic material, having a fiber layer buried therein, said plane area and said area having a plurality of projections being reduced in some areas by uniformly grinding the whole outer surface of said grip to partially expose said fiber layer for comfort to the whip hand.

4,919,421

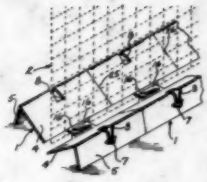
TENNIS BALL DIVERTER

Paul A. Vandeveld, 1930 N. Prospect Ave., Milwaukee, Wis. 53202

Filed Feb. 21, 1989, Ser. No. 312,933

Int. Cl.[5] A63B *61/00, 69/38*

U.S. Cl. 273—29 B **17 Claims**



1. In combination, a tennis court including a court surface, a net extending across said court surface, and a tennis ball diverter comprising a foldable sheet of rigid material including an inclined first panel and a second panel, said panels being disposed at an angle to each other when the diverter is in an operative mode, each of said panels having a lower end and an upper end, said lower ends engaged with the court surface adjacent the lower end of the net when said diverter is in said operative mode and the upper end of the first panel being connected to the upper end of said second panel, and releasable locking means for connecting said panels together in said operative mode and including a tab on one of said panels and an opening to receive the tab disposed in the other of said panels.

4,919,422

CURVE BALL

Hansan Ma, Cape Elizabeth, Me., assignor to Tonka Corporation, Minnetonka, Minn.

Filed Jul. 6, 1989, Ser. No. 376,317

Int. Cl.[5] A63B *37/14*

U.S. Cl. 273—26 R **13 Claims**

1. A ball for throwing in different flight paths having a generally spherical shape and balance,

the ball having an axis,

a first relatively smooth convex surface defined about said axis,

an opposite, second relatively smooth convex surface defined about said axis, and

at least one groove having a non-uniform depth defined in the surface of the ball and extending continuously from said first convex surface to said second convex surface, and through the equatorial region of said ball, said groove being spanned by peaks, the termini of which, with said convex surfaces define the generally spherical shape of the ball.

4,919,423

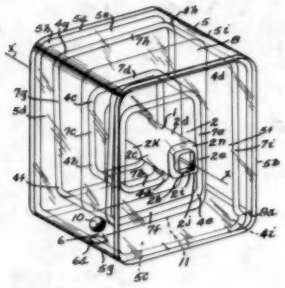
PSYCHOMOTRICITY TEST-TOY

André H. Colart, Chemin des Fermes, Villers sur Trie 60590 Sérifontaine, France

Continuation-in-part of Ser. No. 639,137, Aug. 6, 1984, abandoned. This application Jun. 17, 1988, Ser. No. 271,318

Int. Cl.[5] A63B 67/14

U.S. Cl. 273—109 **5 Claims**



1. A toy of skill usable as a test for evaluating the psychomotricity of an individual comprising an axis to which and around which is associated at least one curved element forming a track on its inner face extending substantially parallel to said axis, and at least one ball adapted to roll on said track by exerting a rotation of the toy around said axis maintained in a substantially horizontal position; said curved element being formed from a continuous strip having portions which are substantially flat and formed to be substantially parallel to said axis with adjacent said flat portions having between them a curved portion.

4,919,424

GOLF PUTTER

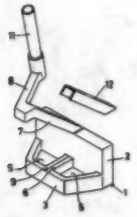
Keisuke Fukumochi; Etsuko Fukumochi; Nobumoto Fukumochi; Naotoshi Fukumochi, and Kazumasa Fukumochi, all of 1-54, Sakuramachie, Nishinomiya, Japan

Filed Apr. 28, 1988, Ser. No. 187,646

Claims priority, application Japan, May 6, 1987, 62-68103[U]

Int. Cl.[5] A63B 53/02

U.S. Cl. 273—164 **3 Claims**



1. A golf putter comprising:

a head having a transversely extending vertical wall having first and second ends and a base attached to and projecting rearwardly from the back of said vertical wall at a lower portion thereof, a front surface of said vertical wall defining a putting surface, and said vertical wall and said base jointly defining a substantially L-shaped section;

an inclined bar having an upper and a lower end, said lower end of said inclined bar being attached to the top center of said vertical wall, said inclined bar extending rearwardly, upwardly, and obliquely, and said inclined bar being substantially perpendicular to the transverse axis of said vertical wall;

a shaft mounting bar having a first and a second end, said first end of said shaft mounting bar being attached to said upper end of said inclined bar, and said shaft mounting bar extending forwardly toward one of said first and second ends of said vertical wall;

a central rib attached to and extending rearwardly from the bottom center of said vertical wall, and said central rib being spaced below and vertically aligned with said inclined bar; and

a vertically extending shaft attached to said second end of said shaft mounting bar.

4,919,425

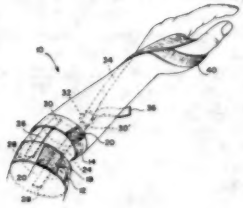
SHOOTING AND TRAINING AID FOR BASKETBALL PLAYERS

Jay W. Wolf, 2205 6th St., Marinette, Wis. 54143

Filed Apr. 24, 1989, Ser. No. 342,093

Int. Cl.[5] A63B 69/00

U.S. Cl. 273—1.5 A **13 Claims**



9. A training and shooting aid for basketball players comprising a first stretchable band member and a second stretchable band member, said first and second band members having free ends, at least one non-stretchable transverse strap member interconnecting said first and second band members, securing means provided on said free ends of each of said band members whereby each of said band members may be adjustably secured around the guide arm of a basketball player, said first band member being adapted to snugly encircle said arm slightly above the elbow, said second band member being adapted to snugly encircle said arm slightly below the elbow, a separable primary nonstretchable strap member having a first end terminating in a loop and having a second free end, at least a pair of ring members provided on said transverse strap member for receiving said second free end of said primary strap member, said loop being adapted to be placed upon the thumb of the guide hand of the player, said second free end of said primary strap member being adapted to be threaded through said ring members whereby the length of said strap member with respect to said second band member may be adjusted so that said thumb is pulled upward toward said elbow and positively retained in said upward position.

13. A method of using a training and shooting aid for basketball players characterized by first and second interconnected band members, each of said band members having first and second free ends, securing means associated with said free ends of each of said band members, a separable strap member having a loop at one end and a second free end, and a pair of ring members associated with said second band member, said method comprising the steps of:

(a) manually placing said first and second band members on the guide arm of a player;

(b) bringing said first and second ends of said first band member together around said arm so that said first band member snugly encircles said player's guide arm above the elbow;

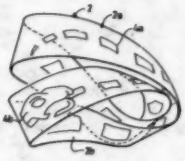
(c) securing said first and second ends of said first band member together by means of said securing means;
(d) bringing said first and second ends of said second band member together around said arm so that said second band member snugly encircles said player's guide arm below the elbow;
(e) securing said first and second ends of said second band member together by means of said securing means;
(f) placing said loop of said separable strap member over the thumb of said player's guide hand;
(g) threading said second free end of said separable strap member through said ring members;
(h) manually pulling upon said second free end of said separable strap member which projects from said ring members in order to tighten said strap member, whereby said thumb is pulled upward toward said elbow.

4,919,426
DUST COVER FOR GAME BOARD
Walter S. Vieira, 370 New Boston Rd., Acushnet, Mass. 02743
Filed Mar. 28, 1989, Ser. No. 329,544
Int. Cl.[5] A63F 3/00
U.S. Cl. 273—148 R 6 Claims

1. A cover for a game board comprising:
(a) a top portion having sides connected thereto, said sides terminating together to define and opening having a substantially continuous peripheral cover edge mountable over edges of a game board to define therewith an enclosed chamber;
(b) said top portion having a corner which in a first position thereof is substantially continuous with said top portion and cover edge and which may be selectively pivoted to a second position to thereby provide an opening;
(c) whereby said game board and cover may be assembled together and inverted so that said game board is above said cover with a playing surface of said game board facing generally downwardly, thereafter said corner may be pivoted to said second position thereof to thereby expose said opening, whereby said game pieces may be removed from said game board by poring them through said opening.

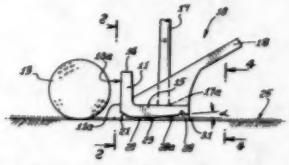
4,919,427
MOEBIUS RING PUZZLE
Itzhak Keidar, 19 Chisin Street; Asher Dromi, 11 Shderot Yotzer, both of Tel Aviv, and Menahem Tilman, 34 Shaldag Street, Hofit, all of Israel
Filed Apr. 3, 1989, Ser. No. 332,141
Int. Cl.[5] A63F 9/08
U.S. Cl. 273—155 6 Claims

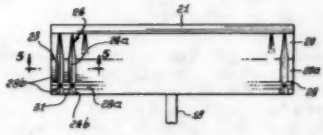
1. A puzzle comprising a strip of flexible sheet material formed into a closed loop having twists to define at least two Moebius rings manually juxtapositionable with respect to each other; said strip being transparent and including opaque markings which are viewable through the transparent strips to define a predetermined pattern, representing a correct solution



of the puzzle, only when said two Moebius rings are located in a predetermined juxtaposition with respect to each other.

4,919,428
GOLF PUTTER WITH BLADE TRACKING, TWIST PREVENTION AND ALIGNMENT TRANSFER STRUCTURE, ALIGNMENT MAINTAINING STRUCTURES, AND AUDIBLE IMPACT FEATURES
Sonnie J. Perkins, 1214 169th Ave., NE., Bellevue, Wash. 98008
Filed Sep. 6, 1988, Ser. No. 240,637
Int. Cl.[5] A63B 53/00
U.S. Cl. 273—164 16 Claims





1. In a golf putter, the combination that comprises
(a) a shaft, a traversely horizontally elongated blade supported by the shaft, the blade having a substantially vertical planar front face, a turf engaging bottom face or sole which extends horizontally and is located rearwardly of the front face, a flat rearward extension of the bottom face which extends rearwardly of and upwardly at an angle relative to and above the horizontal level of the bottom face, and a rear face, that extends upwardly, and generally parallel to the front face,
(b) twist prevention and tracking grooving means provided at said bottom face to engage the turf and guide the blade if it strikes the turf when stroked forwardly, and for resisting twisting of the blade during such stroking,
(c) slip and twist prevention grooving means provided at said rearward extension of the bottom face and rear face for engaging the turf and blocking slipping of the blade as the blade is tilted rearwardly, and when the blade is returned to the normal address position, and
(d) said slip and twist prevention grooving means including a first elongated groove sunk upwardly in said rearward extension of the bottom face to extend lengthwise of the blade, said first elongated groove spaced forwardly of said rear face,
(e) said slip and twist prevention grooving means including

additional multiple grooves sunk upwardly in said rearward extension of the bottom face to extend forwardly and rearwardly, rearwardly of said first elongated groove, and also spaced apart transversely of the blade,

(f) said additional multiple grooves having forward ends intersecting said slip prevention groove, and said rear face,

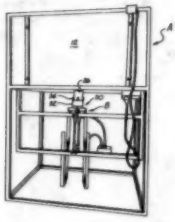
(g) said additional multiple grooves each defined by upwardly converging side surfaces which intersect said rearward extension of said bottom face at forwardly elongated edges engagable with the turf during rearward tilting of the blade for resisting blade side slip, or twist.

4,919,429

HAND SKILL AMUSEMENT GAME

Desmond T. Wittingslow, Jr., RSD 8602, Long Forest Road, Bacchus Marsh, Victoria 3340, Australia

Filed Aug. 28, 1989, Ser. No. 399,177
Int. Cl.[5] A63F *9/00*
U.S. Cl. 273—1 GG **15 Claims**



10. An amusement game device for testing the skill of a person's eye/hand coordination comprising:

a cabinet having a back side, a left side, and a right side, and a front side defining a playing compartment with an open front for access to said playing compartment;

a raised floor carried within said closed cabinet;

an aperture formed in said raised floor through which an object is extended and retracted;

a cabinet having a floor;

carrier means for releasably retaining said object having a first position in which said object may be grasped and a second position in which said object is out of the reach of said person's hand;

retraction means for moving said carrier means from said first position to said second position;

detection means for sensing the presence of said person's hand as it moves toward said object and generating a hand detection signal; and

control means for controlling said retracting means in response to said hand detection signal for retracting said carrier means to said second position after a prescribed time period following generation of said hand detection signal.

4,919,430

GOLF CLUB HEAD

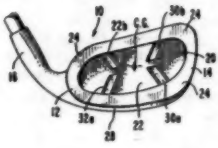
Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204

Continuation-in-part of Ser. No. 25,094, Mar. 12, 1987, Pat. No. 4,826,172. This application May 1, 1989, Ser. No. 345,222
Int. Cl.[5] A63B *53/04*
U.S. Cl. 273—169 **10 Claims**

1. An iron type golf club head having an improved weighting system, said club head having a hosel, a heel, a toe, a bottom surface, an upper surface, a rear surface, a ball striking face, and a center of gravity;

a peripheral mass formed on said rear surface adjacent at least said heel, toe and bottom surface of said club head, said peripheral mass defining a cavity formed within said peripheral mass;

said weighting system including at least two opposing weight members formed within said cavity on said rear surface of the club head, the respective opposing weight members being located on the opposite sides of the center of gravity, said cavity being devoid of any weight member formed on said rear surface at the location of said centre of gravity, at least one weight member being located between and spaced from the center of gravity and the toe and at least a second opposing weight member being located between and spaced from the center of gravity and the heel;



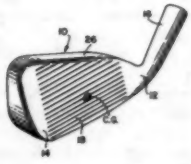
said opposing weight members being angularly disposed with respect to the longitudinal axis of said club head and said weight members being spaced a substantial distance from said center of gravity so that no portion thereof is located at said center of gravity.

4,919,431

GOLF CLUB HEAD

Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204

Continuation-in-part of Ser. No. 25,094, Mar. 12, 1987, Pat. No. 4,826,172. This application Apr. 21, 1989, Ser. No. 341,549
Int. Cl.[5] A63B *53/04*
U.S. Cl. 273—169 **4 Claims**



1. An iron type golf club head having an improved weighting system, said club head having a hosel, a heel, a toe, a bottom surface, an upper surface, a rear surface, a ball striking face, and a center of gravity;

a peripheral mass formed on said rear surface adjacent at least said heel, toe and bottom surface of said club head, aid peripheral mass defining a cavity formed within said peripheral mass;

said weighting system including at least two opposing weight members formed on said rear surface of the club head, the respective opposing weight members being located on the opposite sides of the center of gravity and on a straight line passing through the center of gravity, one weight member being located between and spaced from the center of gravity and the toe and the opposing weight member being located between and spaced from the center of gravity and the heel, and said cavity being devoid of any weight member formed on said rear surface at the location of said center of gravity;

said opposing weight members having outer peripheral edges spaced from said peripheral mass and said center of gravity and being located within said rear cavity, said weight members extending outwardly from said rear

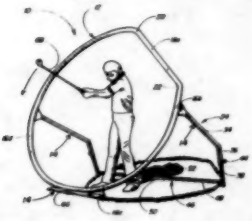
surface into said cavity, and providing a stabilizing means on opposite sides of said center of gravity for providing improved energy transfer to a golf ball struck off the center of gravity.

4,919,432

GOLF SWING GUIDE WITH BACKSWING INDICATOR

Carlos Coggins, 509 Fayetteville Ave., Bennettsville, S.C. 29512, and Patrick O. McCauley, 1 Hidden Hills, Earlysville, Va. 22936

Filed Jun. 2, 1988, Ser. No. 201,450
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—191 A **6 Claims**



1. A golf swing training device to assist in the development of a proper golf swing comprising: a golf club guide in the form of a closed loop for engaging the shaft of a golf club and guiding the golf club during the golf swing, said golf club guide including backswing indicator means coincident with the upper limit of a proper backswing so that when the indicator means is encountered by the shaft of the golf club it can be sensed by the user through the shaft of the club, said indicator means being nonrestrictive so as to enable the golf club to be swung beyond the indicator means.

4,919,433

GOLF PUTTING TRAINER

Sol Gershon, 1363 Mercedes St., Teaneck, N.J. 07666; Charles Fox, 39-08 Tierney Pl., Fairlawn, N.J. 07410, and Norton Garfinkle, 2800 S. Ocean Blvd., Boca Raton, Fla. 33432

Filed Sep. 13, 1989, Ser. No. 406,640
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—192 **9 Claims**

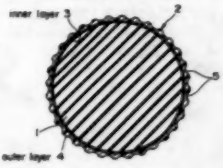
1. A device for golf putting training, comprising:
a central post having upper and lower ends,
a base supporting said lower end of said post holding said post in vertically extending position such that a user can stand close to said post with the user's wrists near said upper end of said post,
a guide arm having upper and lower ends, said lower end having a pivot connection to said base and extending upward at least to said upper end of said post,
a guide track member fixed to said upper end said post and constraining said upper end of said said guide arm to move laterally in a predetermined plane, and
a club retainer pivotally attached to said upper end of said guide arm.

4,919,434

GOLF BALL

Tasuku Saito, Tokorozawa, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 53,123, May 22, 1987, abandoned. This application Jul. 25, 1988, Ser. No. 223,934
Claims priority, application Japan, May 23, 1986, 61-117160
Int. Cl.[5] A63B *37/12*
U.S. Cl. 273—235 R **10 Claims**



1. A solid golf ball comprising a solid core and a cover enclosing said solid core, characterized in that said solid core is one which contains polybutadiene rubber having more than 40% of cis-1,4 bonds and an unsaturated carboxylic acid and/or a metal salt thereof to crosslink the polybutadiene rubber and deforms 1.5 to 3.5 mm under a constant load of 100 kg, and said cover is a 0.4 to 2.2 mm thick which consists of a 0.1 to 2 mm thick inner layer and a 0.1 to 1.5 mm thick outerlayer enclosing the inner layer, both made of thermoplastic resins, said inner layer having a stress of 20 to 100 kg/cm^2 at 10% elongation measured according to ASTM 638-86 and having resilience higher than 40% measured by a Dunlop tripsometer which is defined in British Standard No. 903, and said outerlayer having flexural modulus of 2000 to 5000 kg/cm^2 measured according to ASTM D 790 and a resilience higher than 35% measured by a Dunlop tripsometer as defined above.

4,919,435

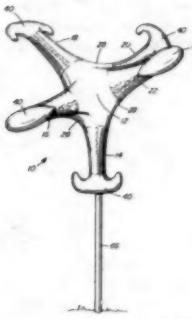
THROWING DEVICE FOR PLAYING GAMES

Gary S. McKinney, Delta, Canada, assignor to Hybos Mfg. Inc., Delta, Canada

Filed Jun. 22, 1988, Ser. No. 209,987
Int. Cl.[5] A63B *65/00, 67/00*
U.S. Cl. 273—339 **15 Claims**

1. A device for playing games comprising a body portion

having a plurality of angularly spaced apart, generally T-shaped members extending therefrom, the members being



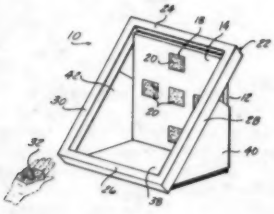
non-coplanar and being asymmetrically spaced around the body portion.

4,919,436

WALL MOUNTED DECORATIVE ART CONVERTIBLE TO A TOSS GAME WITH CATCH AREA

Oscar L. Buselli, 212 S. Sophie St., Bessemer, Mich. 49911

Filed Mar. 30, 1989, Ser. No. 331,611
Int. Cl.[5] A63F 9/02; F41J 1/00
U.S. Cl. 273—346 **15 Claims**



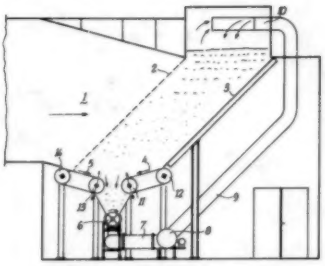
1. A wall hanging toss game comprising the combination of:
a generally flat, rigid member having a first surface suitable for printing, a second surface opposite from the first surface, and an outer periphery between the first and second surfaces, said first surface having a plurality of recesses formed therein spaced from one another;
a plurality of generally thin, wafer-like hook material targets adhesively secured to the rigid member in the recesses of the first surface, such that the targets appear generally flush with the first surface and appear separated from one another by open areas of the first surface;
a frame having spaced vertical frame members, an upper horizontal frame member and a lower horizontal frame member connected to one another and surrounding the periphery of the rigid member;
shock absorbing projectile means covered with loop material capable of being securely held in place when in contact with the hook material targets, said projectile means for throwing at the hook material targets from a distance; and
catch means for catching and supporting the projectile means when the projectile means hit the first surface and fall vertically downwardly, said catch means supported from said frame.

4,919,437

SELF-REGENERATION BALLISTIC PROJECTILE-ARRESTER

Mario Salabe, and Adelio Rossi, both of Rome, Italy, assignors to Impresa Costruzioni Soc. Fra.Sa. a r.l., Rome, Italy

Filed Dec. 5, 1988, Ser. No. 279,893
Claims priority, application Italy, Dec. 3, 1987, 48670 A/87
Int. Cl.[5] F14J 1/12; G01L 5/14
U.S. Cl. 273—410 **11 Claims**



1. A self-regeneration ballistic porjectile-arrester comprising a heap (2) of granulated material for taking up the kinetic energy of projectiles and a regeneration/recovery system for said granular material, comprising
(a) a plurality of means (6) for conveying said material towards a separation zone (7);
(b) means for separating said material from exploded projectiles embedded therein; and
(c) means (8, 9) for delivering said granular material, separated from said projectiles, above said heap;
(d) said projectile-arrester comprising two belts (4, 5) moving in opposite and converging directions for supporting said heap and for conveying said material form the heap towards said conveying means (6), said belts being inclinable with respect to a firing plane of said projectiles and being spaced and opposite to one another under said heap, with their longitudinal axes parallel to a firing axis.

4,919,438

TENNIS RACKET

Minoru Yoneeyama, Niigata, Japan, assignor to Yonex Kabushiki Kaisha, Niigata, Japan

Filed Jun. 10, 1988, Ser. No. 204,876
Claims priority, application Japan, Jan. 23, 1988, 63-6647
Int. Cl.[5] A63B 49/02
U.S. Cl. 273—73 C **4 Claims**

1. A tennis racket comprising a frame portion, a shaft portion having an upper end and a lower end, said frame and shaft

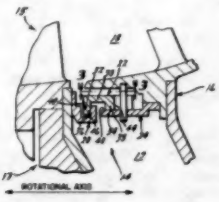
portions being integrally formed of a fiber-reinforced synthetic resin, a grip portion contiguous to the lower end of said shaft portion, and a throat portion provided at the inside lower end of said frame portion to define a ball striking area, wherein said shaft portion has in a direction perpendicular to said striking area a minimum thickness (T2) at a part thereof longitudinally intermediate its upper and lower ends, said minimum thickness (T2) being about 72% of the thickness (T1) at said lower end of said shaft portion, and said frame portion has in said direction a maximum thickness (T3) at side portions thereof which are located on opposite sides of a striking sweet spot at the same distance from said upper end of said shaft portion and a minimum thickness (T4) at the top thereof, said maximum thickness (T3) being about 120% of said thickness (T1) and being about 143% of said minimum thickness (T4), whereby a time elapsed until said shaft portion reaches an initial maximum amplitude value when vibrating in the ball striking direction at an impact of a ball is in the range of 90% to 110% of a time elapsed until said side portions of said frame portion reach an initial maximum amplitude value when vibrating toward the center of said striking area at the impact.

4,919,439

BALANCED RING SEAL

Gregg G. Williams, Milford, Mich., assignor to Williams International Corporation, Walled Lake, Mich.

Filed Oct. 9, 1987, Ser. No. 106,391
Int. Cl.[5] F16J *15/34, 15/54*
U.S. Cl. 277—27 **2 Claims**



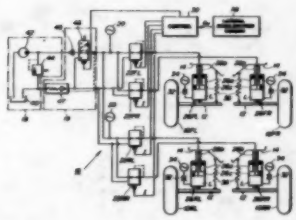
1. A balanced ring seal comprising
a fixed seal segment having a cylindrical radially outwardly orientated bearing surface,
a rotatable seal segment having a circular radially outwardly opening groove therein defining a pair of axially spaced oppositely axially facing bearing surfaces, and
a cylindrical axially movable seal segment of radially inwardly opening "U"-shaped cross section defined by a bight portion and a pair of axially spaced radially inwardly extending leg portions, one of said leg portions having radially extending faces on opposite sides thereof engagable, selectively, with one of the axially facing bearing surfaces of said rotatable seal segment, the other of said leg portions having an annular radially inwardly facing bearing surface engagable with the radially outwardly facing bearing surface on said cylindrical seal element.

4,919,440

ACTIVELY CONTROLLED SUSPENSION SYSTEM FOR AUTOMOTIVE VEHICLE WITH FAIL-SAFE SYSTEM IN RESPONSE TO FAILURE OF ELECTRIC CIRCUITRY

Masahiro Tsukamoto, Kanagawa, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Nov. 29, 1988, Ser. No. 277,376
Claims priority, application Japan, Nov. 30, 1987, 62-301726
Int. Cl.[5] B60G *17/08*
U.S. Cl. 280—707 **14 Claims**



1. An actively controlled suspension system comprising:
a suspension system interposed between a vehicular body and a suspension member rotatably supporting a vehicular wheel, said suspension system including a variable pressure chamber which is filled with a working fluid and variable of the pressure of said working fluid across a predetermined neutral pressure within said variable pressure chamber for varying suspension characteristics;
a fluid circuit means connected to said variable pressure chamber and to a fluid pressure source which circulates pressurized fluid in said fluid circuit;
a first valve means disposed in said fluid circuit and variable of valve position for adjusting pressure supply for said variable pressure chamber from said fluid circuit;
a second valve means disposed between said fluid circuit and said fluid pressure source, which is permitting fluid flow from said pressurized fluid source to said first valve means and blocks fluid flow in the opposite direction at first valve position, and permitting fluid flow from said first valve means to said pressurized fluid source when the fluid pressure at said second valve means is higher than a predetermined threshold level and block fluid flow in the opposite direction;
a sensor means for monitoring preselected suspension control parameter to produce a sensor signal representative thereof;
a fail detector means for monitoring control signal supplied to said first valve means and detecting abnormality of said control signal; and
a controller means for normally operating to produce said control signal on the basis of said sensor signal for adjusting pressure to be introduced in to said pressure and thus for adjusting suspension characteristics in order to suppress attitude change in said vehicular body, and said controller means being responsive to said detector means detecting abnormality of said driver signal, to output a line pressure control signal to be fed to said controller means for switching valve position from said first position to second position in order to maintain the line pressure in said fluid circuit at said neutral pressure.

4,919,441

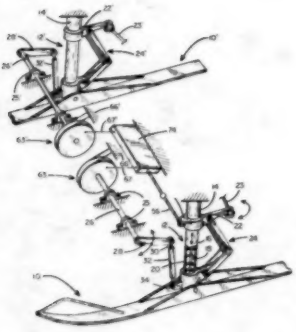
VEHICLE WITH STEERING-CONTROLLED TORSION BAR STABILIZER

Gregory J. Marier, Brooklyn Park; Wayne L. Warnke, Wayzata, both of Minn., and Tetsuo Imai, Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Division of Ser. No. 945,967, Dec. 24, 1986, which is a continuation-in-part of Ser. No. 722,950, Apr. 15, 1985, abandoned. This application Nov. 21, 1988, Ser. No. 273,583

Int. Cl.[5] B62B *9/04*

U.S. Cl. 280—21.1 **7 Claims**



1. An anti-sway apparatus for a recreational vehicle having a frame, first and second steerable members coupled to the frame respectively through independent first and second suspension devices having respective first and second support springs with respective first and second spring constants, each of said support springs alternatively compressible and extensible to allow reciprocating motion of its associated steerable member toward and away from said frame, and a steering means movable relative to the frame for simultaneously controlling said steerable members, comprising:

first and second auxiliary spring means, having respective third and fourth spring constants, disposed between said first and second steerable members;

a first actuatable means coupled to said first auxiliary spring means for selectively forming a coupling of the first auxiliary spring means between said frame and said first steerable member to provide a combined spring force based on the combination of said first and third spring constants in response to first steerable member displacement relative to said frame, and a second actuatable means coupled to said second auxiliary spring means for selectively forming a coupling of said auxiliary spring means between said frame and said second steerable member to provide a combined spring force based on the combination of said second and fourth spring constants in response to second steerable member displacement relative to said frame; and

a control means operatively coupled to said steering means and to said first and second actuatable means for selectively actuating only said first actuatable means responsive to movement of said steering means to a first position relative to the frame, and for selectively actuating only said second actuatable means responsive to movement of said steering means to a second position relative to the frame, said control means actuating neither of said actuatable means when said steering means is intermediate said first and second positions;

wherein each of said first and second actuatable means when actuated couples its associated auxiliary spring means between said frame and associated steerable member when its associated support spring is being compressed; wherein each said actuatable means, during the extension of its associated support spring and while it is actuated, releases its associated auxiliary spring means to prevent the associated auxiliary spring means from resisting movement of its associated steerable member away from said frame during the extension of the associated support spring.

4,919,442

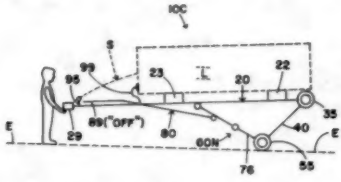
LEVERAGE LIFTING CART

Thomas F. Green, R.R. #1, Box 66B, Council Bluffs, Iowa 51501

Continuation-in-part of Ser. No. 872,026, Jun. 9, 1986, abandoned, which is a continuation-in-part of Ser. No. 650,632, Sep. 14, 1984, abandoned. This application Sep. 6, 1988, Ser. No. 240,715

Int. Cl.[5] B62D *21/00*

U.S. Cl. 280—43.1 **12 Claims**



1. Leverage lifting cart having a procurement mode traversible along a substantially horizontal substrate and at said procurement mode comprises:

(A) a cargo bed extending lengthily longitudinally along a central-axis that is inclined forwardly and upwardly from a said substrate whereby said cargo bed has: a rear-end nearer to said substrate; a front-end overlying said substrate; and an inclined loadable upper-side having a lengthier forward region and also a shorter rearward region for receiving and discharging an arbitrarily selectable load;

(B) said cargo bed at the rear-end being provided with a directionally laterally extending rear-axle;

(C) said cargo bed nearer to the rear-end than to the front-end thereof being provided with a primary-pivot station, the majority of said upper-side rearward region being located rearwardly of said primary-pivot station;

(D) said cargo bed forwardly of said primary-pivot station being provided with anchoring means that permits a cargo load to be attached to the cargo bed forward region;

(E) said cargo bed between said primary-pivot station and said anchoring means being provided with a longitudinally movable and arrestable abutment means for abutting a forward portion of a said arbitrarily selectable load;

(F) a carriage means establishing a cargo bed inclination of the procurement mode and permitting it to traverse along a said substrate, said carriage means comprising:

(Fi) a controllably collapsible upright strut means including a strut upper-length that is pivotably attached to said primary-pivot station and that is pivotably attached to a strut lower-length having a directionally laterally extending front-axle,

(Fii) said rear-axle and front-axle being respectively provided with substrate-engaging means, and

(Fiii) located immediately above and extending along said substrate, laterally separated, non-linear and fixed-length bridge members respectively attached to said rear-axle and to said front-axle so that when said cargo bed is parallel to said substrate, said bridge members lie at an acute angle relative to said substrate; and

(G) control means actuatably extending forwardly upwardly from said collapsible strut means and also alongside the cargo bed, said control means having a forward terminus manually controllably movable from an off-station to an on-station that permits strut means collapsibility, and said forward terminus being manually accessible to an opera-

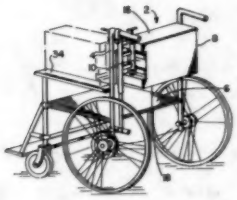
tor located forwardly remote of said cargo bed primary-pivot station.

4,919,443

SWING-OUT BACKPACK FOR WHEELCHAIRS

Garry Kehler, Calgary, Canada, assignor to 378134 Alberta Ltd., Calgary, Canada

Filed Jul. 15, 1988, Ser. No. 219,484
Int. Cl.[5] A47C 7/62
U.S. Cl. 280—304.1 **13 Claims**



1. A swing-out backpack for use on a wheel chair having an armrest provided along at least one side thereof and a side frame and back post assembly behind said armrest having upper handles extending rearwardly away from said armrest and spaced substantially vertically extending side posts connected to said upper handles at opposite sides of the back of said wheelchair comprising:

(a) a container box with sides, a back, a front, a top, and a bottom, having a pivotal door therein providing access to an interior chamber within the box;

(b) structure means releasably securing the container box to the side frame and back post assembly of the wheelchair, said structure means including:

(1) a post formed by a telescopic tube,

(2) means to secure said post to said side frame and back post assembly in vertical orientation to the wheelchair at the armrest side thereof and spaced from one of said side posts, said means to secure said post including clamp means to clamp said post to one of the upper handles of the side frame and back post assembly and a lower clamp tube secured to a lower portion of the side frame and back post assembly and extending outwardly, rearwardly in horizontal orientation therefrom, said post extending between said clamp means and lower clamp tube,

(3) and pivot means extending between said post and the container box, said container box being spaced from said post and pivotally mounted by said pivot means to swing between a first position adjacent and substantially parallel to an armrest of the wheelchair and a second position behind the side posts and the wheelchair and substantially normal to the armrest.

4,919,444

STABILIZER FOR VEHICLES

Heinz Leiber, Oberriexingen; Walter Klinkner, Stuttgart, and Robert Haid, Vöhringen, all of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Stuttgart, Fed. Rep. of Germany

Filed Nov. 28, 1988, Ser. No. 276,805
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1987, 3740244
Int. Cl.[5] B60G 25/00
U.S. Cl. 280—707 **20 Claims**

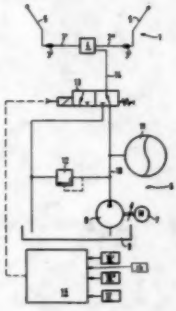
1. A stabilizer for motor vehicles comprising:

a torsion bar divided into independently rotatable first and second parts, each part having a free end and an end adjacent an end of the other part;

coupling means having an open and a closed position for decoupling and coupling, respectively, adjacent ends of the first and second parts to one another, the coupling means varying the degree of allowable rotation of the first and second parts with respect to one another;

means for determining a value of an anticipated transverse acceleration of a vehicle;

means for determining a valued of an actual transverse acceleration of a vehicle; and



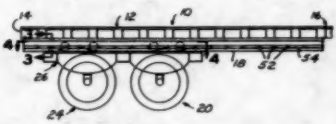
control means for controlling the coupling means to couple the first and second parts together as a function of at least one of a value of an anticipated transverse acceleration of a vehicle, and a value of an actual transverse acceleration of a vehicle.

4,919,445

TRAILER REAR WHEEL SLIDABLE MOUNTING ASSEMBLY

Randy C. Robey, P.O. Box 972, Haskell, Okla. 74436

Filed Feb. 24, 1989, Ser. No. 315,062
Int. Cl.[5] B60P 1/04
U.S. Cl. 280—149.2 **8 Claims**



1. In a tractor-trailer unit having a rearward undercarriage longitudinally slidable relative to the trailer and characterized by a pair of parallel elongated box members underlying the rearward portion of the trailer bed, the horizontal top wall of each box member end portion having pairs of longitudinally spaced openings, the improvement comprising:

a pair of elongated parallel tracks, inverted L-shape in transverse section, longitudinally underlying and secured to the respective lateral under side portion of said bed and nesting the uppermost and laterally outward surfaces of the respective said box member and normally supported by said box members;

roller carriage means including upper and lower pairs of longitudinally spaced-apart rollers disposed within each said box member for lifting and supporting said tracks relative to said box members when a circumferential portion of the uppermost pairs of rollers are disposed within the respective pairs of openings; and,

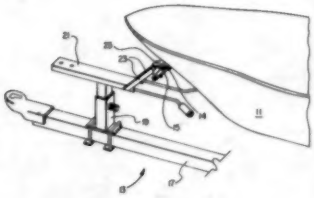
power cylinder means operatively connected with said roller carriage means for longitudinally moving the latter relative to the box members and disposing circumferential portions of the uppermost pairs of rollers within the respective pair of openings.

4,919,446

AUTOMATIC BOAT-TRAILER LOCKING ASSEMBLY

Carl Higgins, 2029 Spicewood, Bedford, Tex. 75021

Filed Sep. 16, 1988, Ser. No. 245,331
Int. Cl.[5] B60P 3/10
U.S. Cl. 280—414.1 8 Claims



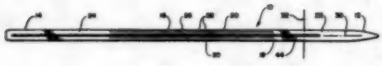
1. A locking assembly for securing a boat to a trailer by means of the boat's bow eye comprising: a frame mounted on the trailer and carrying a bolt which is movable between a locking position in which it engages, in use, through a bow eye of a boat securing the boat on the trailer and a withdrawn position in which the boat can be removed from the trailer; biasing means urging the bolt towards the locking position; means for restraining the bolt in the withdrawn position; trigger means for releasing the bolt from the restraining means to allow it to move toward the locking position; said trigger means comprising a member on the frame movable from a set position in which it can be contacted by the bow eye of the boat as the boat is loaded on the trailer to release the bolt.

4,919,447

CROSS COUNTRY SKI

James E. Jackson, and Denis Wardlow, both of Quebec, Canada, assignors to Allsop, Inc., Bellingham, Wash.

Filed Mar. 18, 1988, Ser. No. 169,623
Int. Cl.[5] A63C 7/06
U.S. Cl. 280—604 27 Claims



1. A cross country ski having a front end, a rear end, two side surfaces, a bottom running surface lying generally in a bottom contact plane, a forward to rear longitudinal axis, a transverse axis, and a vertical axis, said ski being characterized in that said bottom surface is formed with a plurality of grooves extending generally transversely across the bottom surface, each groove comprising:

(a) a middle groove portion extending substantially parallel to the transverse axis;

(b) two side groove portions extending from said middle portion laterally and outwardly to said side surfaces, with a moderate rearward slant at a substantially constant fixed rearward angle; and

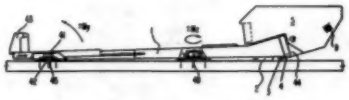
(c) each of said grooves having a forward groove surface portion having a relatively steep vertical alignment component to form a relatively sharp lower forward edge at said bottom surface, and a main surface portion extending from an upper edge portion of said forward groove portion rearwardly at a moderate downward slant to said contact plane.

4,919,448

HEEL PIECE FOR A SAFETY SKI BINDING INCLUDING SINK AND DETENT MECHANISMS

Gerhard Nowak, Biedermannsdorf; Alfred Winter; Hans P. Morbitzer, both of Vienna; Rudolf Theuer, Truman, and Klaus Kruschik, Gumpoldskirchen, all of Austria, assignors to TMC Corporation, Barr/Zug, Switzerland

Filed Dec. 18, 1987, Ser. No. 134,823
Claims priority, application Austria, Dec. 22, 1986, 3405/86
Int. Cl.[5] A63C 9/081
U.S. Cl. 280—618 23 Claims



1. A heel-piece for a safety ski binding comprising:

a binding plate adapted to be pivotally attached to a ski;

a sole holder pivotally movable on said binding plate from a closed position, wherein said sole holder is in operation, to an open position, wherein said sole holder is released from the binding plate in a vertical direction;

link means for connecting said sole holder to said binding plate, said link means including at least one link arm and first and second pivot pins passing through said link arm to allow rotation of the link arm about the first and second pivot pins, wherein said first pivot pin comprises the axis of rotation of the sole holder about the binding plate, said second pivot pin is held on the binding plate by a rib projecting therefrom, and said first and second pivot pins are substantially parallel to each other and substantially perpendicular to the longitudinal axis of the ski; and

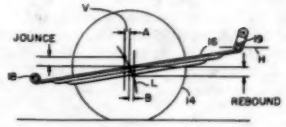
detent means for holding said sole holder in said closed position, said detent means including a detent mounted on one of said binding plate and said sole holder and a detent track mounted on the other of said binding plate and said sole holder, said detent being positioned in said detent track.

4,919,449

VEHICLE REAR SUSPENSION

Geoffrey S. Toms, Newport Pagnell, England, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 25, 1988, Ser. No. 275,875
Int. Cl.[5] B60G 11/36
U.S. Cl. 280—688 13 Claims



1. In a vehicle rear suspension, the combination comprising, a housing member, a mounting pivot pivotally mounting said housing member to the sprung mass of the vehicle, resilient control means between the housing member and the sprung mass subject to deflection during pivotal movement of the housing member relative to the sprung mass about said pivot, a wheel carrier for a rear wheel of the vehicle, resilient suspension means connecting the wheel carrier to the sprung mass, said suspension means being arranged to be operative to provide a rear wheel roll steer effect during cornering of the vehicle, and to that end including link means extending from the wheel carrier to the housing member at a location spaced from said pivot, and means connecting said link means to the

housing member such that reaction forces acting on the rear wheel in a generally vertical direction are transmitted by the link to the housing member to tend to cause pivotal movement of the housing member in a first rotary sense under the control of the resilient means, whereby to modify said roll steer effect, whereas obliquely rearwardly directed impact forces acting on the rear wheel are transmitted by the link means to the housing member to tend to cause pivotal movement of the housing member in a second rotary sense opposite to the first rotary sense with a consequent rearward movement of the rear wheel which is resiliently opposed by said resilient control means.

4,919,450

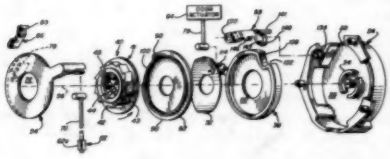
OVERT COMFORT SYSTEM

Gerald A. Doty, Crown Point, Ind., and Eric T. Johnson, Monence, Ill., assignors to Occupant Safety Systems Inc., Olympia Fields, Ill.

Continuation-in-part of Ser. No. 176,304, Mar. 31, 1988. This application Mar. 17, 1989, Ser. No. 325,560

Int. Cl.[5] B60R *21/10*

U.S. Cl. 280—803 **36 Claims**



1. In a seat belt retractor for rewinding a seat belt,

a biasing means for biasing a reel to retract and to rewind the belt on the reel,

an emergency locking means for locking the belt against protraction at the time of an accident,

a tension-relieving means for relieving a tension force applied by the belt onto the body of an occupant in a vehicle by blocking belt retraction and rewinding movement of the reel when the tension-relieving means is in a tension-relieving position,

a manual overt actuator for shifting the tension-relieving means to an activated state for allowing belt retraction to remove slack by rewinding the belt onto the reel prior to a subsequent seat belt protraction to position the tension-relieving means in a tensionless state at the tension-relieving position, and

means operable by belt protraction beyond a predetermined distance to shift the tension-relieving means from its tension relieving position to its ineffective release position allowing the biasing means to rewind the belt onto the reel.

4,919,451

AUTOMATIC SEAT BELT DEVICE

Kazuyoshi Ishiguro; Tatsuo Yamashita, and Kenji Matsui, all of Aichi, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Niwa, Japan

Filed Aug. 2, 1988, Ser. No. 227,232

Claims priority, application Japan, Aug. 5, 1987, 62-120233

Int. Cl.[5] B60R *22/06*

U.S. Cl. 280—804 **30 Claims**

1. An automatic seat belt device for automatically fastening a webbing around a body of an occupant on a vehicle seat comprising:

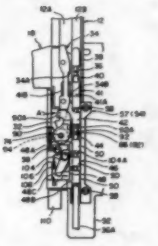
a slider connected to one end of said webbing;

a guide rail for slidably supporting and guiding said slider to forward and rearward directions with respect to a room in a vehicle;

a driving means for driving said slider by means of an elongate member;

a slider stopping mechanism for causing said driving means for stop at a near end portion of movement of said slider in said room of said vehicle including a switch disposed at said near end portion of movement so as to open and close a circuit for operating said driving means, said switch having a stationary contact and a movable contact supported by a pivotable actuator member;

a slider lock mechanism for retaining said slider in locking condition at an end portion of movement thereof in said room of said vehicle; and



a control member supported on said elongate member and being movable therewith for pivoting said pivotable actuator member and said movable contact between an active and an inactive position wherein said movable contact is in contact with said stationary contact and out of contact with said stationary contact respectively, and for controlling said slider lock mechanism.

4,919,452

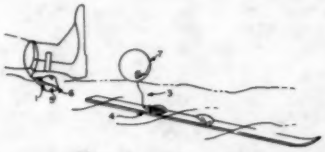
SKI LOCATOR DEVICE UTILIZING A FOAM BALL

John J. Cimino, 408 Ridge Ave., #21-2, Evanston, Ill. 60202, assignor to John J. Cimino, Evanston, Ill.

Filed Mar. 23, 1989, Ser. No. 299,320

Int. Cl.[5] A63C *11/00*

U.S. Cl. 280—809 **5 Claims**



1. A device for locating a ski after the ski has become separated from a skier wearing the ski, said device comprising:

a normally closed, openable pouch, including an exit opening therein and means for attaching the pouch to a skier;

a compressible signal element confined in a compressed state within said pouch and expandable to an expanded state upon release thereof from said pouch through said exit opening in said pouch; and

tether means, having a first end, which extends through said exit opening in said pouch and is attached to said signal element and a second end which is disposed outside of said pouch and which includes means for attaching the second end of the tether means to a ski worn by the skier, for, when the ski is separated from the skier, pulling the signal element out of said pouch through said exit opening so as to permit said signal element to expand to the expanded state thereof and thereby indicate the location of the ski.

4,919,453

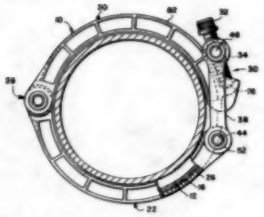
LOW PROFILE V-COUPLING

Horace P. Halling, and Thomas S. Oh, both of Laurel, Md., assignors to EG&G Pressure Science, Inc., Beltsville, Md.

Continuation of Ser. No. 62,617, Jun. 16, 1987, abandoned. This application Jun. 21, 1989, Ser. No. 371,694

Int. Cl.[5] F16L *23/00*

U.S. Cl. 285—3 **25 Claims**



1. A device for coupling the peripheral flanges of a pair of pipes, the combination comprising:

first and second arcuate retaining means, each of said arcuate retaining means having a first end, a second end, and an inner surface, said inner surface including a groove extending between said first and second ends and adapted to receive a portion of the peripheral flanges of the pipes;

means, coupled to said first ends of said first and second arcuate retaining means, for pivotally coupling said first ends together; and

means, coupled to said second ends of said first and second arcuate retaining means, for coupling said second ends together and for radially inwardly moving said first and second arcuate retaining means into intimate contact with the peripheral flanges of the pipes;

said means for coupling and moving comprising an over-center coupling mechanism having a compression bolt for tightening said first and second retaining means about the peripheral flanges of the pipes,

said means for coupling and moving including a primary link having opposite ends, one end being pivotally coupled to said second end of one of said retaining means and the other end being pivotally coupled to said compression bolt so that, when said coupling device is tightly secured to the flanges of the pipes, said primary link overlies a portion of the flanges of the pipes, thereby minimizing the radial size of said coupling device.

4,919,454

TIEBACK CONNECTOR WITH PROTECTIVE LANDING SLEEVE

J. Keith Caulfield; B. Lee Danner, and Lionel J. Milberger, all of Houston, Tex., assignors to Vetco Gray Inc., Houston, Tex.

Filed Feb. 14, 1989, Ser. No. 311,084

Int. Cl.[5] F16L *27/06*

U.S. Cl. 285—18 **8 Claims**

1. In a subsea well having a string of casing with an upper end located within a subsea wellhead, an improved tieback connector for connecting the casing to a conduit extending from the surface, comprising:

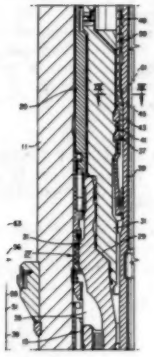
a lower tieback member extending upward from the casing and having a set of lower tieback threads;

an upper tieback member carried by the lower end of the conduit, having a set of upper tieback threads for connection to the lower tieback threads;

a lower landing shoulder located in the wellhead;

a landing sleeve carried by the upper tieback member and having an upper landing shoulder for engaging the lower landing shoulder; and

means for moving the upper tieback member from an upper position to a lower position relative to the landing sleeve by rotating the conduit after the upper landing shoulder has engaged the lower landing shoulder, the upper landing shoulder being located so as to contact the lower landing shoulder before the upper tieback threads contact the



lower tieback threads when the upper tieback connector is in the upper position, the landing sleeve being located so as to cause the upper tieback threads to engage the lower tieback threads when the upper tieback member is in the lower position.

4,919,455

JOINT MECHANISM FOR THIN-WALL STAINLESS STEEL PIPE

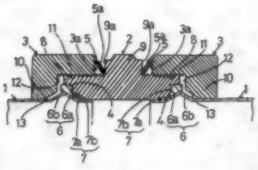
Nakamura Yoshiro, Tsuyama, Japan, assignor to O.N. Industries Co., Ltd., Okayama, Japan

PCT No. PCT/JP88/00451, § 371 Date Jan. 26, 1989, § 102(e) Date Jan. 26, 1989, PCT Pub. No. WO89/11058, PCT Pub. Date Nov. 16, 1989

PCT Filed May 9, 1988, Ser. No. 309,729

Int. Cl.[5] F16L *55/00*

U.S. Cl. 285—23 **2 Claims**



1. A joint mechanism for connecting a pair of thin-wall stainless steel pipes each having at an end portion V-shaped annular bead with first and second inclined faces, which comprises:

a joint sleeve having a diameter sufficiently large to receive said pipe, said joint sleeve consisting of a central enlarged collar portion with a pair of opposite abutment surfaces and a pair of externally threaded sleeve portions extending laterally from said central collar portion and each provided with a terminal abutment surface;

a pair of conical springs each fitted on said externally threaded sleeve portion of said joint sleeve and having a distinctive color on its outside except for its peripheral edge; and

a pair of coupling nuts each having a terminal end portion which defines an end face and an internally threaded portion for engagement with said externally threaded

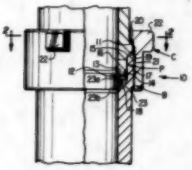
sleeve portion and a reduced fitting portion having a diameter to fit over said pipe, so that when said coupling nut is threaded on said joint sleeve completely, each said bead is engaged by said terminal abutment surface and reduced fitting portion and said end face and said abutment surface engage said conical spring and deform said conical spring into such a configuration that said distinct color is completely covered by said end face and abutment surface and disappears from view, with only said peripheral edge exposed, thus providing a visual signal which indicates that said coupling nut is fully tightened.

4,919,456

UNION FOR PIPE OR TREE WITH METAL AND RESILIENT SEALS

Kwok-Ping Wong, The Colony, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Apr. 10, 1989, Ser. No. 335,893
Int. Cl.[5] F16L *19/02*
U.S. Cl. 285—39 **15 Claims**



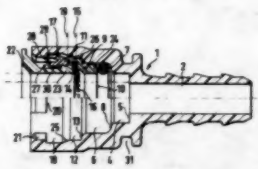
1. A union for pipe comprising:
(a) a pin portion having a resilient seal thereon and a sealing surface therein;
(b) a box portion having threads thereon, a seal bore therein for sealingly receiving said resilient seal, and a sealing surface therein below said seal bore;
(c) a metal seal ring for sealingly engaging said pin portion sealing surface and said box portion sealing surface; and
(d) connecting means for positioning said resilient seal in sealing engagement in said box portion seal bore and said metal seal ring in sealing engagement with said pin portion and box portion sealing surfaces and for connecting said pin and box portions together.

4,919,457

RELEASABLE PLUG CONNECTION

Erminio Moretti, 8, rue Clot-Bey, F-38028 Grenoble, France

Filed Feb. 24, 1989, Ser. No. 314,739
Claims priority, application Fed. Rep. of Germany, Feb. 29, 1988, 3806404
Int. Cl.[5] F16L *37/12*
U.S. Cl. 285—39 **6 Claims**



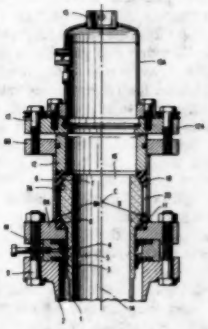
1. In a releasable plug connection for semi-rigid pipes including a housing part having a passage for fluid, several cavities successively larger in steps for receiving connecting parts and an entrance for receipt of a pipe to be connected, wherein the shoulder of a first and smallest cavity serves as a stop for the pipe and the shoulder of a second larger cavity as an abutment for a sealing ring, the ring having an internal diameter less than the diameter of the pipes and being preceded in the plug-in direction by a retaining ring having inwardly projecting spring tabs which form a truncated cone pointing with its apex in the plug-in direction and capable of springing open elastically and a stop ring located between the retaining ring and the sealing ring, the side of which facing the spring tabs is shaped as a cone to limit movement of the spring tabs, there being arranged ahead of the retaining ring in the plug-in direction, a dismounting ring, axially slidable relative to the housing part, and having a conically tapered head portion that fans open the spring tabs of the retaining ring and against the side of the stop ring when the dismounting ring is pressed into the housing part to release the pipe, the improvement comprising a flanged ring portion on the stop ring of larger diameter than the cone shaped portion that rests against the shoulder of a third cavity larger than the second cavity and that serves as an abutment for the retaining ring and a supporting ring located in a fourth cavity preceding the third cavity in the plug-in direction between an end face of the flanged ring portion of the stop ring and an inwardly offset shoulder around the periphery of the entrance of the housing part to hold the retaining ring in place.

4,919,458

DEVICE FOR SEALINGLY MOUNTING TUBES WHICH PASS THROUGH A WALL

Jean-Jacques Masini, Chaponost, and René Chabidon, Saint Genis Laval, both of France, assignors to Atochem, Puteaux, France

Filed Dec. 8, 1988, Ser. No. 281,383
Claims priority, application France, Dec. 17, 1987, 87 17655
Int. Cl.[5] F16L *35/00*
U.S. Cl. 285—110 **7 Claims**



1. An apparatus comprising:
a vessel having a wall,
a tube extending through said wall such that an end portion of said tube is situated outside of said wall, said end portion including an enlargement having first and second outer peripheral segments spaced apart along a longitudinal axis of said tube, said first outer peripheral segment disposed farther from said wall than said second outer peripheral segment, each of said first and second outer peripheral segments being generated spherically by a common radius of generation extending from a center lying substantially on said longitudinal axis, and
means for sealingly mounting said tube comprising:
engaging means engaging said end portion and including first and second surface means engaging said first and second outer peripheral segments, respectively, of said end portion and defining therewith first and second interfaces having the shape of said first and second outer peripheral segments, respectively, said first and second surface means and said first and second outer

peripheral segments together defining a ball joint permitting a limited pivoting motion of said tube about said center, and

at least one elastically flexible seal disposed at a location intermediate said ball joint and said vessel and including means creating a seal between said vessel and a generally circular outer periphery of said tube and limiting said pivoting motion of said tube.

4,919,459

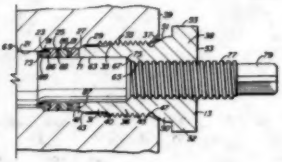
METAL-TO-METAL BACKSEAT LOCKDOWN SCREW

James O. Miller, Tomball, Tex., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Aug. 3, 1989, Ser. No. 389,181

Int. Cl.[5] E21B *19/10*

U.S. Cl. 285—140 **15 Claims**



1. A lockdown screw for holding down a first member within a main bore of a second member, the second member having a radial bore communicating with the main bore, comprising :

a gland nut threadedly insertable within the radial bore, the gland nut having an outer end face and a central axial bore therein, the central axial bore having a threaded portion extending inwardly from the outer end face of said gland nut part way through said gland nut;

a stem threadedly received in said threaded portion of said central axial bore for reciprocation into and out of said gland nut when said stem is rotated, the inner end of said stem projecting into said main bore and having means engageable with the first member for preventing axial movement of the first member with respect to the second member when the lockdown screw is in service;

packing means disposed between said stem and said radial bore for sealingly engaging the outer surface of said stem and the wall of said radial bore;

an annular backseat disposed in said central axial bore of said gland nut inwardly of said threaded portion; and

an annular backseat shoulder disposed on said stem and engageable with said annular backseat of said gland nut for forming a metal-to-metal backseat seal when said stem is baked sufficiently out of said gland nut.

4,919,460

WELLHEAD CASING HANGER SUPPORT MECHANISM

Lionel J. Milberger, and Herman O. Henderson, Jr., both of Houston, Tex., assignors to Vetco Gray Inc., Houston, Tex.

Filed Feb. 6, 1989, Ser. No. 307,412

Int. Cl.[5] E21B *33/04*

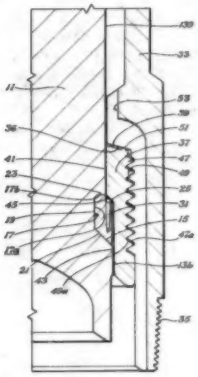
U.S. Cl. 285—141 **5 Claims**

1. In a well assembly having a wellhead housing with a bore for receiving a casing hanger, an improved means for supporting the casing hanger, comprising in combination:

an annular recess formed in the bore of the wellhead housing, having a base which is an upward facing frusto-conical shoulder having an inner diameter and a transverse dimension measured from its inner diameter to its outer extent;

the bore having an upper portion extending upward from the recess which has a greater diameter than the inner diameter of the recess shoulder;

a downward facing conical load shoulder on the casing hanger having a transverse dimension that is substantially less than the transverse dimension of the upward facing shoulder, the casing hanger having an upper portion extending above the load shoulder and a lower portion extending below the load shoulder, the casing hanger upper portion having an outer diameter greater than the inner diameter of the upward facing shoulder, the casing hanger lower portion having an outer diameter that is less than the inner diameter of the upward facing shoulder; and



an annular insert member mounted in the recess, the insert member having a lower frusto-conical surface that mates with the upward facing shoulder and has substantially the same transverse dimension, the insert member having an inner diameter that is substantially the same as the inner diameter of the upward facing shoulder, so as to allow the lower portion of the casing hanger to be lowered through the insert member, the insert member having a frusto-conical upper shoulder which is contacted by the casing hanger load shoulder for supporting the casing hanger, the insert member being of a harder material than the material of the wellhead at the recess.

4,919,461

PRESSURE CYLINDER PIPE COUPLING

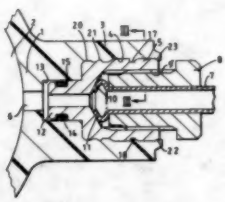
Desmond H. J. Reynolds, West Midlands, England, assignor to Lucas Industries Public Limited Company, Birmingham, England

Filed Jul. 22, 1987, Ser. No. 76,280

Claims priority, application United Kingdom, Jul. 25, 1986, 8618235

Int. Cl.[5] F16L *55/00*

U.S. Cl. 285—174 **15 Claims**



1. A method of making a pressure cylinder having a body of plastics material, a cylindrical pressure-receiving chamber in

the body, a fluid port in the body in communication with the chamber and a socket in the body in communication with the port and having an internal seal engaging surface comprising:

providing a one-piece unitary insert having an integral seat for engagement by a corresponding seat on a pipe to be connected to the cylinder;

providing an external dimension on at least a part of said insert slightly larger than at least a cooperating part of said socket;

providing external locking formations on at least said part of said insert having said larger external dimension for preventing movement of said insert relative to said body;

placing an annular sealing element on said insert;

inserting said insert within the socket by urging said body and insert together axially and simultaneously applying sonic vibration to at least one of said body and insert in order to cause entry of said insert into the socket, with the seal engaging around the internal seal engaging surface of the socket, and deformation of body material into said locking formations for locking said insert axially and rotationally relative to the body.

4,919,462

CONNECTION FITTING FOR A CORRUGATED TUBE

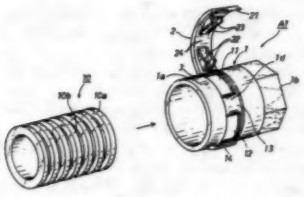
Kazuhiro Matsui, Toyoake, and Hiroji Kitagawa, Nagoya, both of Japan, assignors to Kitagawa Industries Co., Ltd., Nagoya, Japan

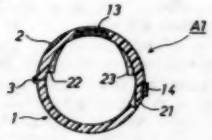
Filed Apr. 19, 1988, Ser. No. 183,239

Claims priority, application Japan, Apr. 28, 1987, 62-105847; Jul. 23, 1987, 62-184367

Int. Cl.[5] F16L *47/00*

U.S. Cl. 285—175 **19 Claims**





1. A connection fitting for a corrugated tube having grooves, comprising:

a cylindrical housing for receiving a corrugated tube, the housing having a pair of openings separated by a wall element;

a bow-shaped locking element for selectively closing the openings and locking in the corrugated tube inserted into the cylindrical housing;

said locking element having an inner peripheral surface with first and second sets of ribs which fit through the openings in the housing into grooves of the corrugated tube when the locking element is closed and locked, said locking element further including a recess between the sets of ribs, said recess corresponding in size to and receiving the wall element such that substantially the entire wall element surface is in contact with the recess;

a hinge portion for connecting movably the locking element with the cylindrical housing;

a hook-like element attached to an end of said locking element opposite said hinge portion; and

an engaging member attached to an end of said opening portion and positioned to receive said hook-like element.

4,919,463

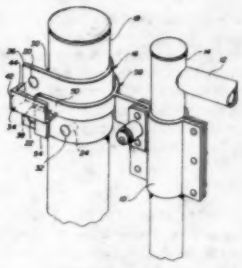
GATE LOCKING DEVICE

Donald E. McQuade, 56 Jefferson St., Red Bank, N.J. 07701

Filed Feb. 13, 1989, Ser. No. 310,349

Int. Cl.[5] E05C *19/10*

U.S. Cl. 292—120 **8 Claims**



1. A gate locking device for connection between first and second pipes in a gate closure comprising:

a U-shaped collar having two connecting arms secured to the first pipe;

a housing formed on one of the connecting arms, the housing having an aperture formed therein;

an oar lock hingeably attached to the second pipe movable between a first position where the pipes are unlocked and a second position where the pipes are locked, the oar lock having a portion formed therein for interfitting into the aperture when the oar lock is in the locked position.

4,919,464

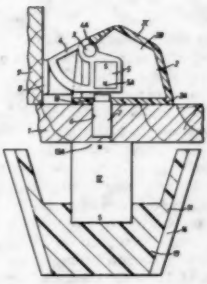
MAGNETICALLY OPERATED LATCH

Roger C. Richards, 8 Church Street, Amersham, Buckinghamshire, Great Britain

Continuation of Ser. No. 92,942, Oct. 4, 1987, abandoned. This application May 16, 1989, Ser. No. 353,178

Int. Cl.[4] E05C *17/56*

U.S. Cl. 292—251.5 **8 Claims**



1. A latch comprising:

(1) an abutment for latching said latch;

(2) a pivotable latching means for latching engagement with

said abutment, said latching means having an abutment engaging portion and a first permanent magnet;

(3) pivot means for pivotally mounting said latching means to a support therefor, wherein said engaging portion and said first permanent magnet are pivotable about said pivot means between a latched position where said engaging portion engages said abutment and an unlatched position where said engaging portion does not engage the abutment;

(4) magnetic material means disposed adjacent to said latching means and in a position wherein the said latching means is pivotable about said pivot means so that said first permanent magnet is attracted to said magnetic material means and placed in juxtaposition therewith, whereby the said engaging portion is maintained only in said latched position;

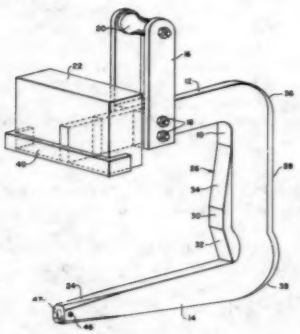
and further comprising a second magnet wherein the disposition of said first permanent magnet in said latching means is in relation to said engaging portion and said pivot means such that said second magnet is positionable to act repulsively upon said first permanent magnet to pivot said latching means to said unlatched condition and wherein in the absence of said second magnet the latching means is only in the said latched condition.

4,919,465

PROTECTOR FOR "C" HOOKS

Michael P. Gembarosky, Lower Burrell; Gary S. Clark, Pittsburgh; Howard E. Baybrook, New Kensington, and Arthur E. Trudgeon, Apollo, all of Pa., assignors to Allegheny Ludlum Corporation, Pittsburgh, Pa.

Filed Nov. 3, 1988, Ser. No. 266,713
Int. Cl.[5] B66C *1/54*
U.S. Cl. 294—67.2 **10 Claims**



1. A protective system for a crane "C" hook to prevent impact damage to coiled strip material lifted by the "C" hook, said protective system comprising:

a receptacle formed in a substantially vertical face at a forward end of a lower horizontal leg of the "C" hook, said receptacle extending substantially horizontally and rearwardly into said forward end; and

a plug of shock absorbing material removably insertable into said receptacle, said plug having a first portion and a second portion, said first portion being receivable in said receptacle, said second portion protruding from said forward end when said first portion is received in said receptacle, said second portion having a rearward face and a forward face, said rearward face conforming substantially in size and shape to the size and shape of said vertical face, said second portion tapering in size from said rearward face to said forward face,

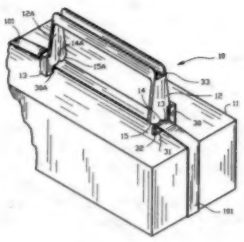
whereby the construction of said plug of shock absorbing material is such that an upper load carrying surface of the lower horizontal leg of the "C" hook is devoid of any covering by said shock absorbing material when said plug is inserted into said receptacle and wherein if the forward end of said lower horizontal leg engages a side of a coil, the shock absorbing material will prevent damage to the coil.

4,919,466

REUSABLE PACKAGE STRAP HANDLE

Donald Consler, Safety Harbor, and Joseph B. Federico, Jupiter, both of Fla., assignors to Paragon Patent Development Inc., Oldsmar, Fla.

Filed Jan. 26, 1989, Ser. No. 301,722
Int. Cl.[5] A45F *5/10*
U.S. Cl. 294—170 **18 Claims**



1. A reusable handle for use on flat lashings, said handle comprising:

a hand grippable section having a finite length, the longitudinal axis of which extends in the same direction as the longitudinal axis of said lashing;

a pair of side sections dispersed on either end of said hand grippable section, said side sections each having a proximal end attached to one end of said hand grippable section and a distal end extended away from said hand grippable section in a plane perpendicular to the longitudinal axis of said hand grippable section;

each said distal end of said side sections including a relatively flat end surface with a curved section thereof;

U-shaped members where the base of each said "U" is relatively flat, and where one side of said "U" is relatively short, said short side being disposed in relationship to said curved section so as to form an expandable slot between the top of said short side and said curved section for the insertion of said lashing; and

means, including said longer side of each of said U-shaped members, for connecting one of said U-shaped members to each of said distal ends of said side sections such that said flat base and said short side of each of said U-shaped member lie in a plane parallel to and offset from said plane of each of said distal end of said side sections, respectively.

4,919,467

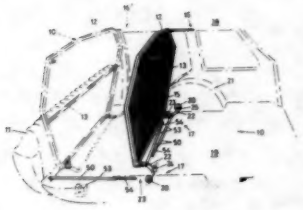
VEHICLE SAFETY SCREEN FIXING MEANS

Mark A. Guimelli, Moana South, Australia, assignor to Rees Operations Pty. Ltd., Pyympton North, Australia

Filed Nov. 9, 1988, Ser. No. 269,963
Int. Cl.[5] B60R *27/00*
U.S. Cl. 296—24.1 **4 Claims**

1. A load safety screen assembly comprising a safety screen including a peripheral frame adapted to be mounted in the interior of a vehicle so as to extend transversely thereof between a load carrying area and a front or rear seat and securing means for anchoring the screen when mounted in the vehicle, said securing means comprising a first pair of bracket means projecting rearwardly from and positioned one at or near each

upper corner of the safety screen frame and a second pair of bracket means projecting rearwardly from and positioned one at or near each lower corner of the screen frame, each said bracket means including a fixed bracket member secured to the frame and movable connector means loosely carried by the fixed bracket member, a pair of upper short length metal securing straps pivotally attached at their forward ends to respective ones of said connector means of said upper bracket means, the rear or trailing end of each of said upper pair of straps being adapted for securement to anchorage points in a body panel in the vicinity of the vehicle roof, a pair of lower short length



metal securing straps pivotally attached at their forward ends to respective ones of said connector means of said lower bracket means, and a pair of lower relatively long length metal securing straps pivotally attached at their forward ends to respective ones of said connector means of said lower bracket means, each of said lower straps having an aperture at its rear or trailing end, and fastening means extending through the apertures for selectively securing either the pair of short length lower straps or the pair of relatively long length lower straps to a pair of opposed anchorage points fixed in a body panel in the vicinity of the vehicle floor.

4,919,468

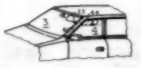
DUAL SUN VISORS

Ibrahim K. Abu-Shumays, and Mary D. Abu-Shumays, both of 1248 Varner Rd., Pittsburgh, Pa. 15227

Continuation-in-part of Ser. No. 158,846, Feb. 22, 1988, abandoned. This application Aug. 1, 1989, Ser. No. 387,784

Int. Cl.[5] B60J *3/02*

U.S. Cl. 296—97.4 **3 Claims**



1. A sun visor for passenger cars; the visor is mounted on, and can rotate vertically with a horizontal rod axle; the end of the rod axle is surrounded by a cylindrical washer which fits sufficiently tightly and is frictionally engaged inside a cylindrical hole in a horizontal direction inside a wide vertical rod; the cylindrical washer is (a) sufficiently loose around the end of the rod axle to allow vertical rotation of the rod axle and visor with little tension, yet (b) sufficiently tight to hold the rod axle and visor in any position following partial rotations;

said wide vertical rod passes through a bracket unit fastened to a corner of a car's interior adjacent to a top corner of the front windshield; said wide vertical rod has a variable circular cross section a little wider just below the bracket unit then inside and above said bracket unit, the function of the wider part being to provide frictional engagement and prevent further movement of said wide vertical rod into the bracket unit; said wide vertical rod has yet a wider washer-like end above said bracket unit and has a spring around it between its washer-like end and the bracket unit; said wide vertical rod can be rotated horizontally in place as a result of little tension exerted on it; the arrangement makes it possible to rotate the rod axle and its associated visor in a horizontal direction;

as a consequence of the ability to rotate the visor in a vertical direction together with its rod axle and the abilitiy to rotate the rod axle together with said wide vertical rod in a horizontal direction, it is possible to position the visor at a top part of the front windshield or a top part of a front side window;

said rod axle has a narrow part near its end inside said wide vertical rod, said narrow part being a little wider than a screw which fits adjacent to it inside said wide vertical rod; the screw serves to fix the location of the rod axle relative to said wide vertical rod yet makes it possible to disassemble and reassemble the rod axle and the associated visor;

said wide vertical rod is mostly hollow inside with its said washer-like end in the form of a gear which has a motor associated with it; the motor including a combination of gears associated therewith to automate the rotation of both said wide vertical rod and said rod axle; the rotations can be conducted manually and can also be conducted automatically by (a) a motor-driven gear pressed against the outside of said washer-like end of said wide vertical rod, and (b) motor-driven gears which are associated with and can rotate the cylindrical washer surrounding the end of the rod axle inside said wide vertical rod.

4,919,469

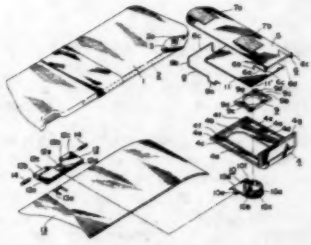
AUXILIARY SUN VISOR FOR AUTOMOBILE

Genya Aizawa, 201 Hayashicho Mansion, 30-2, Sendagi 5 chome, Bunkyo-ku, Tokyo 113, and Kakuhisa Ono, 10-45, Chiyogaoka 6 chome, Aso-ku, Kawasaki-shi, Kanagawa 215, both of Japan

Filed Jun. 9, 1988, Ser. No. 204,390

Int. Cl.[5] B60J *3/02*

U.S. Cl. 296—97.6 **7 Claims**



1. An auxiliary sun visor for an automobile comprising a base plate removably attached to a sun visor installed against a windshield of the automobile, said base plate being formed with an elongate guide hole;

a movable member slidably mounted in said elongate guide hole; means for fixing said movable member at a suitable position along said elongate guide hole;

a colored transparent light shielding plate attached to said movable member;

a strap piece having a first end attached to said base plate and a second end including fastening means; and,

strap folding means attached to said base plate extending from said base plate on one side of the sun visor at a lower end of the sun visor, and including a strap folding portion extending to the other side of said sun visor at an upper end, opposite said base plate, said strap folding means for engaging said strap piece as it is folded around said strap folding portion such that said fastening means on an end of said strap piece engages additional fastening means on said strap piece thereby retaining said base plate fixed to said sun visor.

4,919,470

MOTOR VEHICLE DOOR PANEL

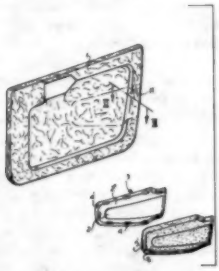
Olaf Müller, Rüsselheim, Fed. Rep. of Germany, assignor to R. Schmidt GmbH, Lennestadt, Fed. Rep. of Germany

Filed Dec. 1, 1988, Ser. No. 278,653

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1987, 3740938

Int. Cl.[5] B60J 9/00

U.S. Cl. 296—153 **11 Claims**



1. In a door panel for a motor vehicle made from a shaped plate-like fiber fleece with an armrest and a cover made of a soft material when called for, the improvement wherein said armrest is a separate thermoplastic injection-molded part which has a flange which is positioned substantially parallel to an appropriate place of attachment on said door panel and said flange is heat sealed or fused with said door panel, said armrest having a plurality of recesses in a transition region of said flange to the resting surface of said arm rest, said cover made of soft material having a plurality of projections engageable and lockable in said recesses on a cover surface facing said armrest.

4,919,471

WEATHERSTRIP FOR SASHLESS DOOR IN AUTOMOTIVE VEHICLES

Hitoshi Seino; Kensuke Kondo, and Takeomi Takamiya, all of Chiba, Japan, assignors to Kinugawa Rubber Industrial Co., Ltd., Chiba, Japan

Filed Mar. 15, 1989, Ser. No. 324,216

Claims priority, application Japan, Mar. 16, 1988, 63-62506; Dec. 28, 1988, 63-332504; Feb. 28, 1989, 64-48802

Int. Cl.[5] B60J 9/00; E06B 7/16

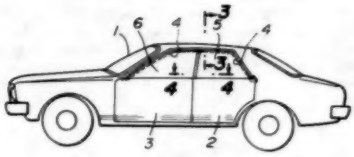
U.S. Cl. 296—154 **12 Claims**

1. A weatherstrip for a sashless door for automotive vehicles, comprising:

an extrusion molded member provided on a roof rail and pillars of a vehicular body, having a pair of seal lip portions through which said extrusion molded member mates with the end and the inner perimeter surface of the window of said sashless door in a water tight fashion, said pair of seal lip portions define a groove between the both top ends thereof;

an end member provided on the outer surface of the side panel of said vehicular body, said end member connected to the lower end of said extrusion molded member;

an opening provided on said end member in the vicinity of the connecting portion between said extrusion molded member and said end member, said opening being associated with said groove lying at the lower end of said extrusion molded member for permitting captured water within said groove to drain therefrom; and



a fluid passage connected to said opening for exhausting said water outside of the vehicular cabin.

4,919,472

ROOFTOP DRAG REDUCING DEVICE FOR MULTI-TRUCK SHIPMENT WHEN MOUNTED

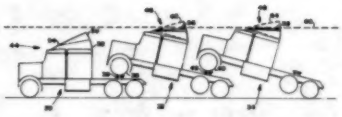
Nathaniel C. Wiley, Jr., Weston, Conn., assignor to Airshield Corporation, Bridgeport, Conn.

Continuation of Ser. No. 926,892, Nov. 4, 1986, Pat. No. 4,784,424. This application Nov. 14, 1988, Ser. No. 270,944

The portion of the term of this patent subsequent to Nov. 15, 2005, has been disclaimed.

Int. Cl.[5] B62D 35/00

U.S. Cl. 296—180.2 **17 Claims**



1. A drag reducing device comprising:

(A) a bottom portion adapted for rigid mounting on the roof of a vehicle; and

(B) a top portion hingedly mounted along the front thereof to the front of said bottom portion and adapted to be articulated into said bottom portion.

4,919,473

STRUCTURAL SHAPE (BEAM) ESPECIALLY FOR RAMMING PROTECTION IN SIDE DOORS AND WALLS OF MOTOR-VEHICLE BODIES

Johann Laimighofer, Braunau; Peter Garnweidner, Salzburg; Peter Üblacker, Dürmoss, and Johann Luttinger, Schalchen, all of Austria, assignors to Austria Metall Aktiengesellschaft, Braunau am Inn, Austria

Filed Nov. 10, 1987, Ser. No. 119,138

Claims priority, application Austria, Nov. 10, 1986, 2983/86

Int. Cl.[5] B60R 27/00

U.S. Cl. 296—188 **17 Claims**

1. A collision-resistant reinforcement for a side wall or side door of a motor vehicle comprising a beam composed of a rectangular cross section one-piece tube having a pair of parallel spaced-apart webs and a respective pair of flanges bridged

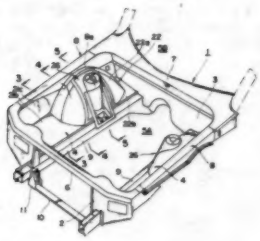
by said webs, each of said flanges projecting laterally beyond said webs along opposite sides of said beam, said beam being supported so as to constitute one of said flanges as a compression flange on a side of potential impact and the other of said flanges as a tension flange, said compression flange being provided with openings over a central portion thereof and having said compression flange cut away at opposite ends of said beam, so that said compression flange remains generally intact between said ends, said compression flange being formed with overhangs projecting laterally beyond said webs, said overhangs being formed with respective pair of spaced apart edges and said overhangs being formed with at least some of said openings.

4,919,474

AUTOMOBILE FRONT BODY STRUCTURE

Ryoichi Adachi, and Shyuji Muraoka, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Apr. 27, 1989, Ser. No. 343,598
Claims priority, application Japan, Apr. 27, 1988, 63-106021
Int. Cl.[5] B62D *25/08*
U.S. Cl. 296—194 **6 Claims**



1. A front body structure of an automobile body having a front wheel apron constituting a side wall of an engine room, comprising:

front frame means extending in a lengthwise direction of said front body structure and connected to a lower portion of said front wheel apron;

side extension means laterally overhanging from an upper portion of said front wheel apron and extending in said lengthwise direction, said side extension means being formed therein with an intermediate space adjacent to a portion of said front wheel apron where a suspension assembly is supported;

stiffener means disposed in said space of said side extension means and secured to said side extension means, said stiffener means having a rigidity higher than said wheel apron; and

reinforcement means extending in a lengthwise direction of said front body structure over said upper portion of said front wheel apron and connected to said side extension means and said stiffener means to form a closed cross-section in cooperation therewith.

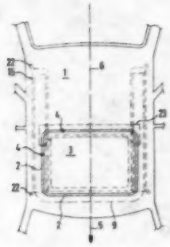
4,919,475

SLIDING ROOF OR SLIDING LIFTING ROOF FOR MOTOR VEHICLES

Albert Schlapp, Dreieich, and Norbert Kunz, Maintal, both of Fed. Rep. of Germany, assignors to Rockwell-Golde G.m.b.H., Fed. Rep. of Germany

Filed May 10, 1989, Ser. No. 349,738
Claims priority, application Fed. Rep. of Germany, May 31, 1988, 3818476
Int. Cl.[5] B60J *7/02*
U.S. Cl. 296—213 **18 Claims**

1. A sliding roof or sliding lifting roof for a motor vehicle, with a rigid cover and also provided with an intermediate frame in the case of the sliding lifting roof, the rigid cover being displaceably guided on lateral guide rails, optionally together with the intermediate frame, which guide rails are fixed to a roof frame, which surrounds a roof cutout of the fixed vehicle roof, and the rigid cover being driven by a drive cable guided in the guide rails and engaging on guide parts connected thereto; the guide rails are arranged entirely below the fixed vehicle roof and are fixed to the roof frame, which is



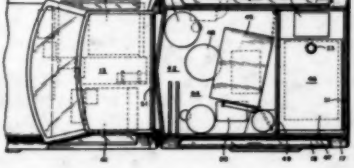
closely adjacent to the fixed vehicle roof and fitted thereto, being set back with respect to the roof cutout edge; a water channel is provided below the guide rails and at a limited distance therefrom, the water channel being elastically deformable from above at least on its edge adjacent to the roof cutout edge and the guide parts connecting the cover and optionally the intermediate frame to the guide rails passing through the elastically expandable gap between the roof cutout edge and the elastically deformable water channel edge.

4,919,477

COMPACT PIZZA PREPARATION AND DELIVERY VEHICLE

Lynn R. Bingham, Tulsa, Okla., and Jerome R. Henke, Rose Hill, Kans., assignors to Pizza Hut, Inc., Wichita, Kans.

Filed Oct. 17, 1988, Ser. No. 258,969
Int. Cl.[5] B60P *3/00*
U.S. Cl. 296—24.1 **35 Claims**



1. A compact pizza preparation and delivery vehicle comprising:

a self-propelled vehicle comprising a driver's compartment with a driver's seat and a cargo compartment behind the driver's compartment;

a refrigerated case located in the driver's compartment within access of a driver in the driver's seat for storing pizza shells and pizza toppings;

an assembly table located on top of the refrigerated case upon which a pizza shell is placed while pizza toppings are applied thereto;

a pizza oven in the cargo compartment which is adapted and positioned so that, while sitting in the driver's seat, a

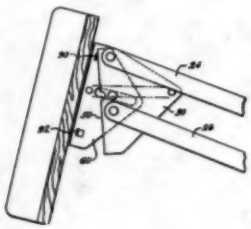
driver can insert an unbaked assembled pizza into the oven and remove a baked pizza from the oven.

4,919,478

SAFETY OTTOMAN

Bill D. Tacker, Okolona, Miss., assignor to Super Sagless Corporation, Tupelo, Miss.

Filed May 22, 1989, Ser. No. 354,830
Int. Cl.[5] A47C *1/034*
U.S. Cl. 297—85 **16 Claims**



1. A safety ottoman assembly movable between extended and retracted positions comprising

a pair of spaced apart and parallel side brackets for mounting on a mechanism to move the assembly including the brackets between the retracted and extended positions,

a pair of ottoman angles each having a plate essentially parallel to the brackets with one angle being associated with each bracket, each angle also having a flange substantially perpendicular to the plate and lying forward of the bracket with which it is associated, said flanges being provided for supporting an ottoman board,

a slot provided in the plate of each angle and a pin mounted on each bracket and extending into the slot of the associated angle for supporting the angles on the brackets and enabling the angles to move rearwardly and forwardly on the brackets and also permitting the tops and bottoms of the angles to pivot away from the brackets,

a pair of stops carried on each angle plate, one adjacent to the top and the other adjacent the bottom thereof and limiting the rearward travel of the angles on the brackets,

and a spring joining the associated angles and brackets and biasing the angles to a rearward position on the brackets.

4,919,479

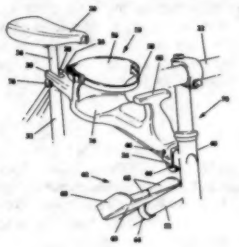
APPARATUS FOR CARRYING A PASSENGER ON A BICYCLE

Eunice R. Loewke, 1307 Jasmine Cir., Rohnert Park, Calif. 94928, and Daniel D. Loewke, 3060 N.E. Wheeler St., Poulsbo, Wash. 98370

Filed Aug. 19, 1988, Ser. No. 233,817
Claims priority, application Australia, Aug. 20, 1987, 77264/87
Int. Cl.[5] B62J *1/28*
U.S. Cl. 297—195 **7 Claims**

1. An apparatus for carrying a passenger on a bicycle having a seat supported on a seat post and a forward frame portion for supporting a handle bar and front fork assembly, including: a passenger seat for supporting a passenger, carrier means extending from the seat post substantially to the forward frame portion for supporting said passenger seat, said carrier means including a generally rigid support member extending generally along a longitudinal axis and having a proximal end and a distal end, first means disposed at said proximal end of said rigid support member for releasably receiving the seat post of the bicycle, said first means engaging the seat post in rotationally immobile fashion about said longitudinal axis, and second means disposed at said distal end of said rigid support member for releasably engaging the forward frame portion of the bicycle;

said second means for releasably engaging the forward frame portion of the bicycle including a bracket assembly secured to said forward frame portion of the bicycle, and



means for releasably securing said distal end of said support member to said bracket assembly;

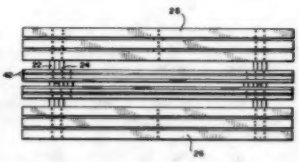
said distal end of said support member including a recess formed in a lower end surface thereof, said recess being dimensioned to receive a portion of said bracket assembly therein.

4,919,480

SECTIONAL BENCH

James H. Drew, III, P.O. Box 5536, Augusta, Ga. 30916

Filed Sep. 22, 1989, Ser. No. 410,754
Int. Cl.[5] A47C *11/00*
U.S. Cl. 297—244 **18 Claims**



9. The sectional bench of claim 1 wherein each of said A-shaped support sections further comprises a second horizontal brace fixed to and spanning each joined pair of upright members, said second horizontal brace being opposite and parallel to said first horizontal brace, whereby, upon assembly, the two rails of each rail pair rest on said first and second horizontal braces, respectively.

4,919,481

MULTIPLE POSITIONABLE CHAIR CONSTRUCTION

Edward A. Garabedian, 4151 Arch Dr., #311, Studio City, Calif. 91604

Filed Jan. 3, 1989, Ser. No. 292,997
Int. Cl.[5] A47C *3/02*
U.S. Cl. 297—258 **6 Claims**

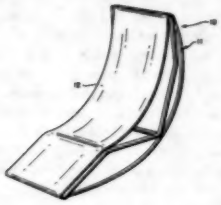
1. A chair construction, comprising:

first and second side frames, each including, a continuously curved support element having one concave portion and one convex portion, the convex side being adapted for contacting a ground plane,

a tubular side member arranged within a support element concave portion having its ends and a central point secured to the said support element, each tubular side member having a first bend at the central point secured to a support element, a second bend above the first bend approximately at shoulder height for a seated chair user, and

a third bend substantially behind the knees of a seated chair user;

a plurality of equilength rodlike braces each having its two ends respectively secured to the first and second side frames forming a unitary framework; and



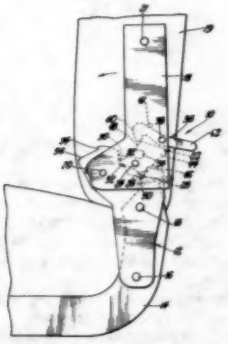
a flexible sheet of material having opposite end portions connected to two of the braces leaving the central part thereof unsupported providing a seating surface.

4,919,482

INERTIA LATCH FOR VEHICLE SEATS

David E. Landis, Oxnard, Calif., and Douglas G. Del Grosso, Canton, Mich., assignors to Lear Siegler Seating Corp., Southfield, Mich.

Filed Jan. 20, 1987, Ser. No. 4,961
Int. Cl.[5] B60N 1/04
U.S. Cl. 297—379 17 Claims



1. A seat assembly (10) having a forward folding back for use in a vehicle and comprising;

a support frame (12) for fixed support in a vehicle,

a back frame member (18) pivotally supported by said support frame (12) for forward pivoting movement between an upright seating position and a forwardly folded position,

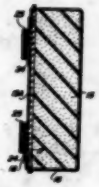
an inertia latch member (22) rotatably mounted on said back frame member (18) to coact in a first position with said support (12) frame for limiting forward pivoting movement of said back frame member (18) from said upright position only when the initial forward movement thereof exceeds a predetermined acceleration, said assembly (10) characterized by said support frame (12) including locking means to automatically coact with said inertial latch member (22) in a second position in said forwardly folded position for automatically locking said back frame member (18) in said forwardly folded position

4,919,483

COLLAPSIBLE AND REFORMABLE HEADREST FOR VEHICLES

Gregory R. Horkey, P.O. Box 3035, Monterey, Calif. 93942

Filed Jun. 16, 1989, Ser. No. 367,240
Int. Cl.[5] A47C 7/38
U.S. Cl. 297—395 3 Claims



1. A headrest comprising:

a cushion,

said cushion comprising a body of plastic foam containing a plurality of air filled pores and a casing of substantially nonporous material surrounding said body of plastic foam,

a port extending from atmosphere through said casing into contact with said pores,

a flap valve for controlling said port,

said flap valve comprising a resilient strip of material adhesively attached at one end to said casing and covering said port at its other end,

said valve opening under pressure of air being expelled from said pores of said cushion to atmosphere upon a compression force being applied to said cushion and rapidly closing said port when air under vacuum conditions is drawn from atmosphere into said pores of said cushion through said port upon cessation of the compression force, thereby causing said cushion to gradually return to its original configuration, and

hook and loop fastening means mounted on said cushion,

said fastening means comprising a first member secured to said cushion and providing a first surface for interlockingly engaging a second surface of a second member when an opposed surface thereof is adhesively attached to a window of a vehicle.

4,919,484

ANTI-CINCH SEAT BELT SYSTEM

Jerry D. Bougher, Lebanon; James R. Anthony, Carmel; Jeffrey L. Williams, Zionsville; Ronald F. Homeier, Plainfield, and Allan R. Lortz, Carmel, all of Ind., assignors to Indiana Mills & Manufacturing, Inc., Westfield, Ind.

Continuation-in-part of Ser. No. 111,182, Oct. 22, 1987. This application Jan. 26, 1989, Ser. No. 302,788
The portion of the term of this patent subsequent to May 23, 2006, has been disclaimed.
Int. Cl.[5] A47C 31/00
U.S. Cl. 297—474 18 Claims

1. A seat belt assembly which comprises:

a first belt connector;

a retractor assembly;

linking means between said first belt connector and said retractor assembly;

a mounting bracket;

a second belt connector lockable with said first belt connector to form a tongue-buckle combination;

a first connecting member connectable with said bracket;

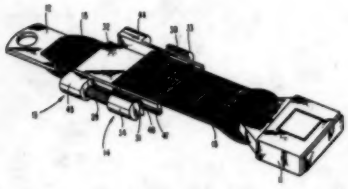
first connecting means for connecting said first connecting member with said bracket;

a second connecting member connectable with said second belt connector;

second connecting means for connecting said second connecting member with said second belt connector;

said first connecting member being coupled with said second connecting member and being movable relative said second connecting member between first and second positions, said second belt connector being retracted relative said bracket in the first position, said second belt connector being extended relative said bracket in the second position; and,

maintaining means composed of at least one biasing member and being for normally maintaining said second belt connector and said bracket in the first position and for exerting a predetermined force to retain said first connecting member and said second connecting member in the first position, said maintaining means also being for permitting said second belt connector and said bracket to move under resistance from the first position to the second position in response to an external force exceeding the predetermined force, said maintaining means also being for returning said second belt connector and said bracket from the second position to the first position upon decrease of the external force below the predetermined force.



4,919,485

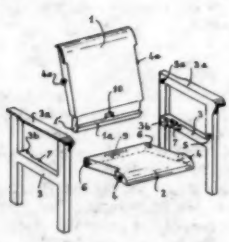
SEATS CONSTRUCTED OF INTERLOCKING ELEMENTS

Jean-Paul Guichon, Pratz, France, assignor to Grosfillex S.A.R.L., Arbent, France

Filed Jun. 20, 1988, Ser. No. 208,750

Int. Cl.[5] A47C 4/02

U.S. Cl. 297—443 **15 Claims**



1. A chair having assemblable components comprising a seat, a back and a pair of spaced sides, said seat having front and rear portions, said sides having a front portion and a rear portion, said back having upper and lower portions, a pair of oppositely oriented first locking studs extending outwardly of said front portion of said seat, said first locking studs having an irregularly shaped portion, a first opening in each of said front portions of said sides, said first openings being profiled so as to cooperatively receive said first locking studs therein when said seat and said sides are aligned in a non-use position and for cooperatively retaining said first locking studs when said seat and said sides are a proper alignment for use, a pair of second locking studs extending outwardly on opposite sides of said back and intermediate said upper and lower portions of said back, said second locking studs having an irregularly shaped portion, a second opening in each of said rear portions of said sides, said second opening being profiled so as to cooperatively receive said second locking studs when said back and said sides are aligned in a non-use position and for cooperatively retaining said second locking studs when said seat and said sides are in a proper alignment for use, a pair of lugs extending outwardly from said rear portion of said seat, a bearing member on each of said sides and adjacent said rear portions thereof, said lugs being cooperatively seated within said bearing members when said seat and said sides are aligned in a use position, and said sides have opposing stop members extending outwardly therefrom, said stop members being spaced adjacent to said bearing members and in spaced relationship below said second openings, said lower portion of said back abutting said stop members when said back is moved to a use position whereby said back and said seat may be cooperatively interlocked with said sides for assembled use.

4,919,486

VEHICULAR SEAT

Isamu Chinomi, and Yuji Tanaka, both of Kanagawa, Japan, assignors to Ikeda Bussan Co., Ltd., Ayase, Japan

Filed Apr. 20, 1989, Ser. No. 340,683

Claims priority, application Japan, Sep. 24, 1988, 63-125012

Int. Cl.[5] A47C 7/00

U.S. Cl. 297—443 **3 Claims**

1. A vehicular seat comprising:

a rectangular seatback frame;

a side plate secured to one side lower portion of the seatback frame;

a hook member integral with and raised from said side plate;

a reclining device having a pivotal arm;

first means defining at a leading free end of said pivotal arm a rectangular recess, said rectangular recess being so sized and constructed as to make a latching engagement with said hook member;

second means defining in said side plate and said pivotal arm first and second pairs of mated openings;

first and second bolts passing through said first and second pairs of mated openings respectively; and

first and second nuts operatively engaged with said first and second bolts respectively;

wherein said rectangular recess is above said openings of said pivotal arm in the direction to said leading free end of said pivotal arm.

4,919,487

CHAIRS HAVING CROSS BAR SEAT SUPPORT

Terence Gibbs, Nyack, N.Y., assignor to Omni Products International, Inc., Fairfield, N.J.

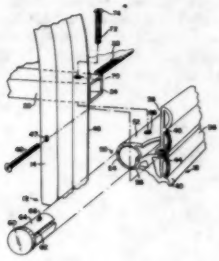
Filed Sep. 5, 1989, Ser. No. 402,832

Int. Cl.[5] A47C 1/12

U.S. Cl. 297—445 **12 Claims**

1. In a chair structure having a chair seat section including first and second transversely spaced legs, a transverse cross brace fixed to and rigidly interconnecting said legs, first and second transversely spaced seat side support members having respective first and second end portions, and means extending between said seat side support members for forming a seat

therebetween, the improvement wherein said cross brace comprises an elongate member having an outer side, first and second spaced apart end sections and an inner side, said inner side including support means thereon for supporting said end portions of said seat side support members on said end sections of said elongate cross brace member, with said end portions of said seat side support members being substantially shielded from view, in front elevation, by said outer side.

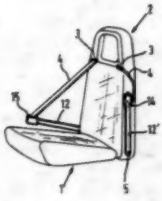


4,919,488

VEHICLE SEAT WITH A SAFETY BELT SYSTEM

Elmar Deegener, Stelzenberg; Harald Wolsiefer, and Heinz P. Cremer, both of Kaiserslautern, all of Fed. Rep. of Germany, assignors to Keiper Recaro GmbH & Co., Fed. Rep. of Germany

Filed May 17, 1989, Ser. No. 352,890
Int. Cl.[5] A47C *31/00*
U.S. Cl. 297—468 **10 Claims**



1. A vehicle seat having a seat portion supported on slide rails, a back rest, and a safety belt system having a belt closure with two closure elements, the belts of which are connected in the area of the upper end section of the back rest to two upper connection points lying spaced from each other in the lateral direction of the seat, and in the area of the rear end of its seat portion, are connected to one of the lower ends of the back rest, said seat portion, or said slide rails, at two lower connecting points provided on the respective sides of the seat, one of said respective sides of the seat being an access side, comprising:

two lap belts (6) each running from one of the respective lower connecting points (5) to said closure elements (14, 15), respectively, of said belt closure;

two shoulder belts (4), each running from one of the respective upper connecting points to one of said closure elements (14, 15) of the belt closure, each of said lap belts (6) being guided by one of said shoulder belts (4);

first and second pivot arms (12, 12'), each defining a respective pivot plane for guiding the respective lap belts (6), said pivot arms (12, 12') being connected with the seat frame in the area of one of the lower connecting points (5) respectively, so as to pivot about respective axes (8, 11) extending in the lateral direction of the seat;

said two pivot arms (12, 12') being formed so as to resist bending in their respective pivot planes and to be elastically flexible laterally thereto;

said first pivot arm (12) being connected with the other pivot arm (12') by gear means (8, 9, 10), the output of which is opposite to the input pivot movement;

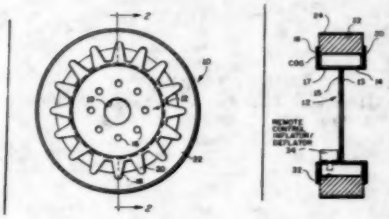
wherein said second pivot arm (12') is arranged on the access side of the seat and lies upright at the side of the seat adjacent to the back rest (2) in its stowed position, and said first pivot arm (12) extends forward and holds the shoulder belt (4) connected therewith at least nearly tensed when said second pivot arm is in its stowed position.

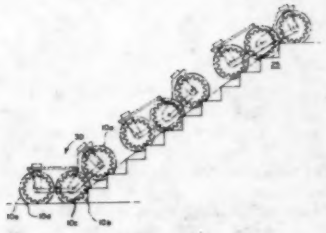
4,919,489

COG-AUGMENTED WHEEL FOR OBSTACLE NEGOTIATION

M. Alan Kopsco, Wantagh, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Apr. 20, 1988, Ser. No. 183,953
Int. Cl.[5] B60B *15/26*
U.S. Cl. 301—44 T **3 Claims**





1. A wheel adapted for overcoming obstacles and comprising:

a hub;

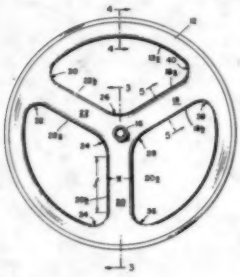
a foam annulus means circumferentially mounted to the hub for normally rolling over a contacted surface and yielding in areas encountered by obstacles; and

cog means coaxially located on both sides of the annulus means and normally extending less radially outwardly than the annulus means for engaging the obstacle and rolling the wheel thereover.

4,919,490
VEHICLE WHEEL

Mark W. Hopkins, Newark, and Frank S. Principe, Hockessin, both of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 12, 1988, Ser. No. 258,312
Int. Cl.[5] B60B 5/02
U.S. Cl. 301—63 PW 16 Claims

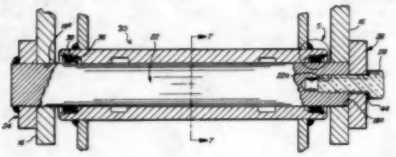


1. A wheel comprising: a circular member, a hub concentric with said circular member, and a plurality of elongated spokes connected between said hub and said circular member, each of said spokes having a leading and a trailing edge, an aerodynamic profile, and an aspect ratio greater than about 3.0 said aspect ratio being constant throughout the length of the spoke.

4,919,491
WHEEL ASSEMBLY

Robert J. Heideman, 34316 Barton, Westland, Mich. 48185

Filed Feb. 26, 1988, Ser. No. 160,921
Int. Cl.[5] B60B 37/10
U.S. Cl. 301—124 R 19 Claims



1. A wheel assembly for use at the four corners of a cart to rollably support the cart, said wheel assembly comprising:

(A) a pair of flange mounting plates adapted to be rigidly secured to a respective corner of the cart and extend downwardly from the main body of the cart in parallel spaced relation;

(B) an aperture in the lower end of each mounting plate;

(C) an axle passing slidably through said apertures in said mounting plates and presenting a journal portion of round cross section between said plates;

(D) a wheel comprising a tubular hub positioned between said mounting plates and journalled on said axle journal portion, a rim, and means rigidly interconnecting said rim and said hub in concentric relation;

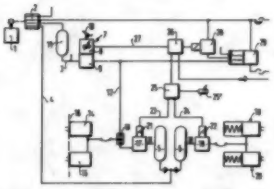
(E) means defining an annular lubricant reservoir along the annular journal interface of said hub and said axle journal portion; and

(F) an elastomeric annular seal at each end of said interface at opposite sides of said annular lubricant reservoir.

4,919,492
MULTIPLE-CIRCUIT BRAKE SYSTEM

Hakan Samuelson, Enhörna; Eric Thoms, Akers Styckebruk, both of Sweden; Ingolf Grauel, Vaihingen/Enz, Fed. Rep. of Germany; Werner Stumpe, Kornwestheim, Fed. Rep. of Germany, and Franz Maurer, Schwieberdingen, Fed. Rep. of Germany, assignors to SAAB-Scania AB, Sodertalje, Sweden and Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 3, 1983, Ser. No. 500,720
Claims priority, application Fed. Rep. of Germany, Aug. 20, 1982, 3230970
Int. Cl.[5] B60T 13/66, 8/02
U.S. Cl. 303—3 2 Claims



1. A multiple-circuit brake system for motor vehicles including front and rear wheel axles, equipped with front and rear brake cylinders thereon, comprising a multiple-circuit braking value transducer, said multiple-circuit braking value transducer including a variable electrical control section which varies electric-current intensities and a fluid-medium control section, which for brake actuation simultaneously controls at least one fluid pressure-medium brake circuit and one electrically triggered brake circuit, said electrically triggered brake circuit being equipped with at least one electronic switching member and first and second electrically triggered fluid-medium control valves for respectively controlling fluid-medium flow to said front and rear brake cylinders, said fluid medium control section of said brake value transducer including an input and an output, said at least on fluid pressure-medium brake circuit comprising a first fluid-medium supply line connected to said input of said fluid medium control section and a first fluid pressure-medium brake line connected to said output of said fluid medium control section, a first fluid medium reservoir disposed in said first fluid medium supply line to said input of said braking value transducer associated with the at least one fluid pressure-medium brake circuit, at least one two-way check valve, said at least one two-way check valve includes a first inlet side connected to said first fluid pressure medium brake line connected to said output of said fluid-medium control section of said braking value transducer and an outlet side connected to a second fluid pressure medium brake line connected to at least one of said front brake cylinders for controlling fluid pressure to the front brake cylinder, said two-way check valve further including a second inlet side which is connected to a third fluid pressure-medium brake line connected to said first electrically triggered fluid medium control valve which controls a fluid-medium under pressure from a second fluid-medium supply line via a first branch line to said second inlet side of said two way check valve and then out through the outlet side of said two-way check valve to said front brake cylinder, said two-way check valve being triggered directly by pressure from said first electrically triggered fluid medium control valve, said second electrically triggered fluid medium control valve being connected to said fluid medium supply line via a second branch line for controlling fluid under pressure in said second fluid medium supply line to said rear brake cylinders, a second reservoir connected to said first branch line and connected to said first electrically triggered fluid control valve and a third reservoir connected to said second branch line and connected to said second electrically triggered fluid control valve whereby said front brake cylin-

ders may be controlled electrically as well as by fluid pressure and said rear brake cylinders may be operated electrically.

4,919,493

METHOD AND APPARATUS FOR CONTROLLING BRAKE PRESSURE IN VEHICLE BRAKE SYSTEMS

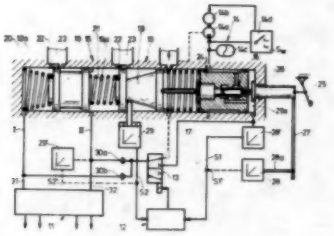
Heinz Leiber, Theodor-Heuss Str. 34, D-7141 Oberriexingen, Fed. Rep. of Germany

Continuation of Ser. No. 828,791, Feb. 12, 1986, abandoned. This application May 13, 1988, Ser. No. 196,843

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1985, 3511579

Int. Cl.[5] B60T *8/00*

U.S. Cl. 303—15 **18 Claims**



1. An apparatus for controlling brake pressure in brake circuits of a vehicle brake booster including a booster piston, a booster pressure chamber (**29***a*) and an associated pedal-actuated brake valve (**15**) operatively contained within said booster piston for feeding a pressure medium from a pressure medium supply means into said booster pressure chamber, a master brake cylinder (**16**) and first and second master brake pistons (**18, 19**), and first and second master piston pressure chambers, the master brake cylinder being connected to the brake circuits (I, II) including wheel brakes, a feed valve (**13**) connected to said booster pressure chamber and to each of said brake circuits (I, II), at least one pressure transducer means (**28', 29'**) connected to one of said master piston pressure chambers of said booster pressure chamber for producing an output signal (**S1, S2'**), and at least one travel transducer means (**28, 29**) operatively connected to said vehicle brake booster for producing an output signal (**S1', S2**), and an electronic logic circuit means connected to receive each said signal output of each of said at least one pressure transducer means and at least one travel transducer means for generating a feed valve actuating signal by comparing variable signals transferred from said at least one pressure transducer means and said at least one travel transducer means for actuating said feed valve to change a pedal characteristic curve course to another pedal characteristic curve course in accordance with a predetermined correction range beginning preferably immediately after a start of a pedal travel out of a rest position of said pedal by delivering booster pressure emanating from said booster pressure chamber directly into said brake circuits while said first and second master brake pistons are actuated by said pedal actuated hydraulic brake booster.

4,919,494

ANTI-SKID BRAKE CONTROL SYSTEM WITH AVOIDANCE OF ABRUPT AND SUBSTANTIAL VARIATION OF WHEEL SLIPPAGE

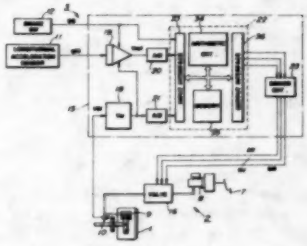
Akira Higashimata, and Yoshiki Yasuno, both of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 27, 1989, Ser. No. 343,992

Claims priority, application Japan, Apr. 28, 1988, 63-107270

Int. Cl.[5] B60T *8/32*

U.S. Cl. 303—100 **11 Claims**



1. An anti-skid brake control system for controlling a braking pressure for maintaining a wheel slippage in the vicinity of a predetermined optimum level said anti-skid control system comprising:

a braking circuit connecting a pressurized fluid source to a wheel cylinder for each of said front and rear wheels for building up braking pressure in the latter;

a pressure control valve means, disposed in said braking circuit, for controlling braking pressure in said wheel cylinder, said pressure control valve means operable for increasing braking pressure in said wheel cylinder in a first mode, decreasing braking pressure in said wheel cylinder in a second mode, and to hold the braking pressure in said wheel cylinder constant in a third mode;

first sensor for monitoring rotation speed of associated one of the front and rear wheels for producing a wheel speed indicative signal;

second means for deriving a wheel slippage on the basis of said wheel speed indicative signal and producing a wheel slippage data;

control means for producing a first control signal for controlling operation mode of said pressure control valve means for switching operation mode between said first, second mode and third mode in order to maintain wheel slippage in the vicinity of said predetermined optimum value, said control means measuring a period in which said pressure control valve means is maintained at said third mode subsequently of said first mode operation so that increasing rate of braking pressure is varied according to said period.

4,919,495

ANTI-SKID CONTROLLED HYDRAULIC BRAKE SYSTEM

Dieter Kircher, Dortelweil, and Paul Schwarzer, Hofheim, both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 20, 1988, Ser. No. 287,307

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1987, 3744070

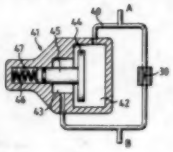
Int. Cl.[5] B60T *11/10, 8/50*

U.S. Cl. 303—113 **1 Claim**

1. In an anti-skid controlled hydraulic brake system including a master cylinder, a pressure medium storage reservoir, at least one hydraulically controlled wheel brake connected to said master cylinder via a brake line and to said reservoir via a

relief line, pressure modulation means in each of said brake and relief lines for modulating the pressure applied to said brake in response to pressure control signals, a pump having an intake connected to said reservoir and an outlet connected via a pressure line to said brake line at a location between said modulation means and said master cylinder;

the improvement comprising means defining a restricted orifice in said brake line between said master cylinder and



said pressure line, a bypass line connected to said brake line in parallel to said orifice, valve means in said bypass line normally biassed by a spring to an open position accommodating substantially unrestricted flow of pressure medium through said bypass line and movable to a closed position blocking flow through said bypass line when the pressure in that portion of said brake line between said master cylinder and said orifice exceeds a preselected pressure.

4,919,496

PROCESS OF MONITORING AND CONTROLLING AN ANTI-LOCKING AUTOMOTIVE BRAKE SYSTEM FOR CARRYING OUT THE SAID PROCESS

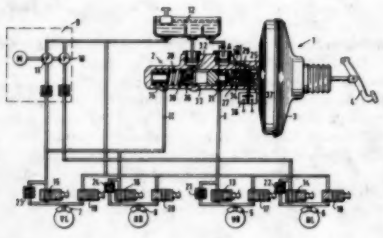
Jochen Burgdorf, Offenbach-Rumpenheim, and Lutz Weise, Mainz, both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 23, 1988, Ser. No. 248,508

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1987, 3732162

Int. Cl.[5] **B60T** *8/44, 13/16*

U.S. Cl. 303—114 **16 Claims**



1. A process of monitoring and controlling an anti-lock automotive brake system having a brake pressure generator comprising a tandem master cylinder, with a primary and an intermediate piston disposed in working chambers therein, and an auxiliary pressure source operable during anti-lock regulation to supply a pressure medium to said working chambers of said master cylinder, to restore said primary piston, said auxiliary source operable through a central valve in said master cylinder to discharge excess pressure medium from said working chambers through said central valve to a pressure medium reservoir in proportion to a pedal force, comprising the steps of:

turning said auxiliary pressure source on and off in response to the postion of said primary piston disposed within said tandem master cylinder;

determining the maximum distance between said primary and said intermediate pistons wherein said maximum distance is determined when a bolt, which is axially displaceable within a sleeve of said intermediate piston, is positioned outside of said sleeve to an extent necessary to allow said central valve to open; and

opening said central valve, upon exceeding said maximum distance, to connect said working chamber, and its associated brake circuit, to said pressure medium thereby advancing said primary piston and thereby turning on said auxiliary pressure source.

4,919,497

TESTS OF ELECTROHYDRAULIC SWITCHING VALVES WITH FLUIDIC BALL ELEMENTS

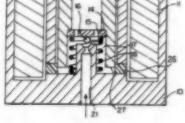
Guenter Kaes, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 3, 1988, Ser. No. 227,398

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1987, 3725810

Int. Cl.[5] **B60T** *8/36;* **F16K** *31/02*

U.S. Cl. 303—119 **5 Claims**



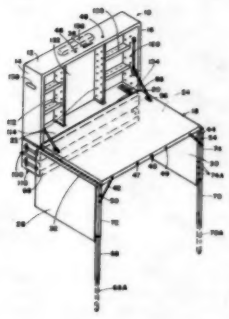
1. A magnetic valve with self regulation of a flow medium for use in anti-skid brake systems (ABS), having large flow cross section for normal braking and a reduced flow cross section in ABS operation, comprising a valve housing **(10)**, a control coil **(11)** in said valve housing, a tubular armature **(13)** displaceably supported within said control coil, a valve body **(17)** in said housing, a stationary valve seat on said valve body **(17)**, a sealing element holder **(15)** in said valve housing which is carried by said armature, a sealing element **(16)** on said sealing element holder which is moved by the armature relative to said stationary valve seat, a valve opening spring which applies a valve opening force on said sealing element holder to slowly enlarge an opening cap between said valve body **(17)** and the sealing element **(16)**, said armature having a bottom portion **(27)** that communicates with an inflow region of said valve housing, said inflow region encompassing said sealing element **(16)** associated with said sealing element holder **(15)**, the sealing element **(16)** and the stationary valve seat being formed and disposed such that within a predetermined stroke and flow ranges, an aspiration effect due to the flowing medium ensues due to fluid flow from an inlet in said valve body via said valve seat through said gap to an outlet **(22)**, and a retaining means adapted to act upon the armature **(13)** counter to suction forces created by said aspiration effect, which after termination of an electrical excitation of said control coil of the magnetic valve, forces emanating from strong aspiration effects are overcome due to increasing flow rates and said retaining means is able to move said armature and said sealing element **(16)** a full stroke away from said stationary valve seat when strong aspiration effects disappear below a pre-set limit.

4,919,498

COLLAPSIBLE DESK

De Maris C. Turner, 7471 S. Marion, Tulsa, Okla. 74136

Continuation-in-part of Ser. No. 144,048, Jan. 14, 1988, abandoned. This application Nov. 17, 1988, Ser. No. 273,370
Int. Cl.[5] A47B *85/00*
U.S. Cl. 312—241 13 Claims



1. A collapsible wall supported convertible desk assembly which comprises:

a box-like storage cavity having a first and second side frame, a top frame, a bottom frame, each having a back edge, a back member mounted to said first and second side frame, said top frame and said bottom frame, at a distance from the back edge of each such that said top frame has a top overhang and said bottom has a bottom overhang;

first attachment bracket means attached to the underside of said top overhang member and to the top side of said bottom overhang for attachment to said wall;

a single piece planar desk member having a flat work surface on one side and a flat opposite side, two side edges and a front and back edge, said back edge hingedly mounted to a front edge of said bottom frame;

a first and second door, each said first and second door having a top edge, each door hingedly secured to one of said side edges of said desk top and foldable between a first position in which it is parallel with said desk member and a second position which is at least about 90° therefrom;

and first and second latching bracket means to selectively retain said respective first and second doors in said first position or said second position.

4,919,499

OPTICAL PRINTER OF SCANING TYPE

Masahiko Aiba, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 15, 1988, Ser. No. 206,734
Claims priority, application Japan, Jun. 15, 1987, 62-148868
Int. Cl.[5] G02B *26/10*; G01D *15/06*
U.S. Cl. 350—6.6 8 Claims

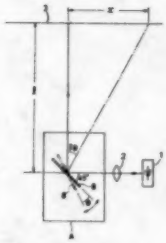
1. An optical printer of the scanning type comprising:

a light emitting element drivable in accordance with printing data for emitting light;

an optical system to focus said light from said light emitting element onto a photosensitive member;

mirror means, movably interposed between said optical system and said photosensitive member, for deflecting the focused light from said optical system to cause the focused light to scan said photosensitive member at a high speed; and

driving means for pivotally movably supporting said mirror means so as to direct a reflecting surface of said mirror means toward said light emitting element and simple harmonic motion within a specified range of angles, thereby minimizing variations in scanning velocity.

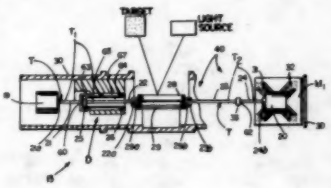


4,919,500

TORSION BAR SCANNER WITH DAMPING

Dean R. Paulsen, Watertown, Mass., assignor to General Scanning, Inc., Watertown, Mass.

Filed Sep. 9, 1988, Ser. No. 242,789
Int. Cl.[5] G02B *26/10*
U.S. Cl. 350—6.6 26 Claims



1. A scanner comprising:

a first spring,

at least one node point R defined on said first spring for a rotational frequency f_R,

at least one node point V defined on said first spring for a vibrational frequency f_V, and

at least one first damper, said damper located on said first spring at point R at some distance from point V, said damper configured to substantially impede transmission of vibrations at said frequency f_V.

4,919,501

OPTO-MECHANICAL DEFLECTOR

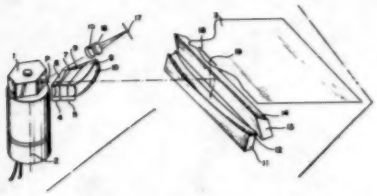
Michael Plaot, Eschborn, Fed. Rep. of Germany, assignor to Linotype AG, Eschborn, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 136,736, Dec. 22, 1987, abandoned. This application Jan. 23, 1989, Ser. No. 300,250
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1986, 3644124
Int. Cl.[5] G02B *26/10, 3/06*
U.S. Cl. 350—6.8 7 Claims

1. Opto-mechanical deflector with at least one rotatable or slewable scanning mirror arranged to be struck by a substantially parallel beam bundle which is focused onto a flat image lane by way of a first plano-convex lens arranged near it, the convex face of which is traversed substantially at right angles by the reflected beam, thereby forming a—second—aplanatory system, and by way of a concave mirror arranged near the image plane,

characterized in that a first aplanatic system is provided between the first plano-convex lens (8) and the scanning mirror (1) and that the first aplanatic system (49 consists of

a plano-concave lens (7), having a refractive index substantially identical to that of the first plano-convex lens (8), and of a second plano-convex lens (6), cemented to the



concave face of the plano-concave lens (7) and having a refractive index substantially less than that of said plano-concave lens (7).

4,919,502

TILT ERROR CORRECTIVE SCANNING OPTICAL SYSTEM

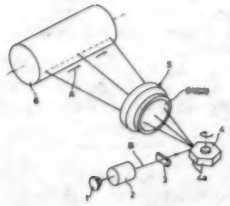
Kazuo Yamakawa, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 13, 1987, Ser. No. 72,723

Claims priority, application Japan, Jul. 14, 1986, 61-165125; Aug. 21, 1986, 61-196209; Aug. 21, 1986, 61-196210; Aug. 22, 1986, 61-197850

Int. Cl.[5] G02B *26/10*

U.S. Cl. 350—6.8 **31 Claims**



1. A tilt error corrective scanning optical system for a system having deflecting means for deflecting and reflecting a beam of light, comprising:

a linear image forming optical device for causing a beam emitted from a light source to form a linear image on a deflecting and reflecting surface of said deflecting means, and

a scanning image forming optical device for causing the beam reflected and deflected by said deflecting means to form an image on a scanned object, said scanning image forming optical device consisting of a first lens disposed between said deflecting means and said scanned object, and a second lens disposed at a side of said first lens opposed to said scanned object, wherein said first lens includes a cylindrical surface, and said second lens includes a toric surface.

4,919,503

OPTICAL COMPONENT FOR FIBER-OPTICAL TRANSMISSION SYSTEMS

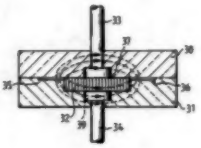
Gerd Mroynski, Paderborn, Fed. Rep. of Germany, assignor to Krone Aktiengesellschaft, Berlin, Fed. Rep. of Germany

Filed Dec. 27, 1988, Ser. No. 291,536

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1988, 3804822

Int. Cl.[5] G02B *6/36*

U.S. Cl. 350—96.2 **15 Claims**



1. An optical component for two or more optical fibers, comprising: a first support guide plate; a second support guide plate cooperating with said first support guide plate to form a guide space positioned between said first and second guide plates; an adjustment plate with optical portions having different optical properties formed of dielectric material displaceably positioned in said guide space, said guide space having a length which is greater than the length of said adjustment plate; electrode means associated with at least one of said first and second support guide members, said electrode means generating at least one electric field acting to position said adjustment plate, formed of dielectric material, in said guide space whereby the build-up of an electric field causes the dielectric adjustment plate and optical portions to move relative to the support guide plate; and, terminal means connected to said electrode means for applying voltage to said electrode means for controlled positioning of said optical portions having different optical properties.

4,919,504

GRADED-INDEX WAVEGUIDES

Etienne G. Colas, Asbury Park, and Alfredo Yi-Yan, Eatontown Boro, both of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed May 17, 1989, Ser. No. 353,407

Int. Cl.[5] G02B *6/10*

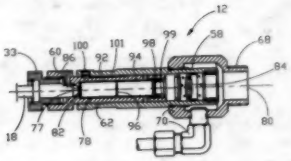
U.S. Cl. 350—96.12 **10 Claims**

1. An optical waveguide having a graded index of refraction comprising a semiconductor substrate having one or more grooves extending along a surface thereof, and means, over and within said grooves, for providing a graded effective index of refraction including a region having an increasing effective index of refraction extending upwardly toward the surface of the waveguide, said means extending beyond the top of the groove to form a planar surface having refractive index cusps over the grooves wherein the effective refractive index of the material adjacent the cusps is less than the effective refractive index of the material forming the cusps.

4,919,505
INFRARED THERMOMETER WITH FIBER OPTIC REMOTE PICKUP

George Bartosiak, Naperville; Christopher Siskovic, Libertyville; Henry H. Tap, Algonquin; Sam Paris, Chicago, and Arthur E. Goldberg, Evanston, all of Ill., assignors to Square D Company, Palatine, Ill.

Filed Jan. 12, 1989, Ser. No. 296,225
Int. Cl.[5] G02B 6/32; H01J 5/16; G01J 5/00
U.S. Cl. 350—96.18 28 Claims



1. In a remote infrared thermometer for sensing temperature from a remote target physically unconnected with the remote infrared thermometer having a sensing head for converting light signals applied to a light input port thereof to corresponding electrical output signals representative of temperature and an analyzer for converting the electrical signals to an indication of temperature, the improvement being a remote pickup assembly, comprising:

a fiber optic cable assembly including

a fiber optic cable having an input end and an output end for transmitting light therebetween,

a first connector for mechanically connecting the output end of the fiber optic cable to the light input port of the sensing head, and

a second connector at the input end of the fiber optic cable; and

a remote, focusable, reimaging lens assembly including

a protective lens housing having an input end for gathering light directly from the remote physically unconnected target and a lens for focusing said gathered light,

an output port housing having a light output port for receipt of light focused thereon by the lens mechanically attached through means of the second connector to the input end of the fiber optic cable;

means mounted within the output port housing for defining a fixed aperture intermediate the lens and the light output port at a substantial and fixed distance from the output port; and

means for mounting said light output port to said protective lens housing for substantial movement relative to said lens to change the distance between the input end of the fiber optic cable connected thereto and the lens without movement of the lens relative to the physically unconnected remote target to proportionately change the distance between the input end and the physically unconnected, remote target upon which the lens is focused.

4,919,506
SINGLE MODE OPTICAL FIBER COUPLER

Robert L. Covey, Hightstown, N.J., assignor to General Electric Company, Schenectady, N.Y.

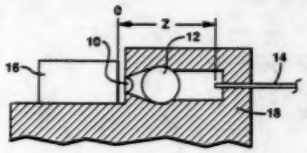
Filed Feb. 24, 1989, Ser. No. 314,854
Int. Cl.[5] G02B 6/32
U.S. Cl. 350—96.18 14 Claims

1. An optical coupling device for coupling a substantially point source of light to a single mode light conducting fiber having a first optical axis, said device comprising:

a hemispherical lens having a planar surface and a spherical surface, said lens having a second optical axis normal to said planar surface;

a spherical lens having a given optical axis; and

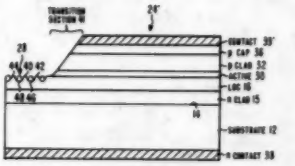
means adapted for positioning said planar surface facing said source of light and said spherical lens spaced between the spherical surface of said hemispherical lens and said fiber, said first, second and given axes being substantially aligned with said point source, said lenses being so dimensioned and spaced relative to said source and fiber so as to focus light from said source for reception by said fiber, said hemispherical lens being so dimensioned and so positioned relative to said source of light such that the angle of incidence of light onto said hemispherical lens and the angle of the light refracted from the hemispherical lens are substantially the same.



4,919,507
SEMICONDUCTOR RADIATION COUPLING SYSTEM

Gary A. Evans, West Windsor Township, Mercer County, and Jay B. Kirk, Hamilton, both of N.J., assignors to General Electric Company, Schenectady, N.Y.

Filed May 10, 1989, Ser. No. 349,607
Int. Cl.[5] G02B 6/34
U.S. Cl. 350—96.19 26 Claims



26. An optical grating comprising:

a planar substrate; and

a grid of spaced nodular optical elements on the substrate adapted to receive semiconductor laser emitted radiation in a direction parallel to the plane of the substrate and adapted to deflect the received radiation to a direction different than the received direction.

4,919,508
FIBEROPTIC COUPLER

Kenneth P. Grace, Woodland Park, and Facundo Aparicio, Colorado Springs, both of Colo., assignors to The Spectranetics Corporation, Colorado Springs, Colo.

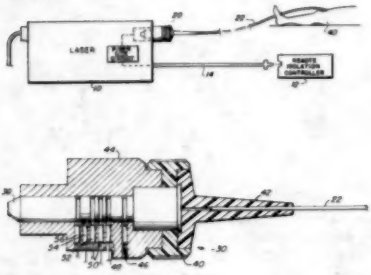
Filed Aug. 4, 1988, Ser. No. 228,278
Int. Cl.[5] G02B 6/42
U.S. Cl. 350—96.20 11 Claims

11. A fiberoptic coupler for connecting a fiber optic catheter to a laser light source comprising:

a male plug portion, the male plug having an enlarged handle region for supporting an end of an optical fiber catheter, the handle region having a plurality of relief openings located at selected ones of a plurality of positions within said handle region, said openings being indicative of the diameter of the optical fiber being coupled to the laser light source;

a female receptacle portion removably connected to said male plug portion; and

sensing means, disposed in said female receptacle portion, for sensing the location of said openings in the male plug handle region, said sensing means including microswitches located at predetermined positions in said recep-



tacle portion, said receptacle portion positions corresponding to said plurality of positions within said handle region, said microswitches sensing which of said position in said handle region openings, are provided.

4,919,509

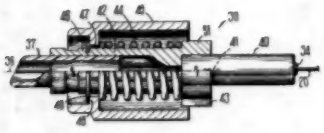
MECHANICAL CONNECTION FOR POLARIZATION-MAINTAINING OPTICAL FIBER AND METHODS OF MAKING

Calvin M. Miller, Duluth; David N. Ridgway, Conyers, and Frederick M. Sears, Norcross, all of Ga., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 3, 1989, Ser. No. 306,414

Int. Cl.[5] G02B *6/38*

U.S. Cl. 350—96.21 **23 Claims**



1. A connection between polarization-maintaining fibers, said connection including:

first and second ferrules each having an associated passageway extending therethrough and opening to an end face of a ferrule, each said passageway having a cross section transverse to a longitudinal axis of the associated ferrule which is defined by at least one substantially straight side;

two polarization-maintaining optical fibers each having an end portion disposed in the passageway of one of said ferrules, each said optical fiber having an outer cladding layer which in a cross section transverse to the longitudinal axis is defined by at least one substantially straight side that is substantially parallel to said substantially straight side of said passageway of the ferrule in which the end portion is disposed and to one of orthogonal polarization axes of said each optical fiber;

marking means being associated with each said ferrule and being disposed in a predetermined orientation with respect to said substantially straight side of said outer cladding layer of said fiber end portion disposed in the passageway of said each ferrule; and

supporting means for holding said first and second ferrules to cause said marking means of said ferrules to be aligned longitudinally and hence to cause the polarization axes of one fiber end portion to be aligned with the polarization axes of the other fiber end portion.

4,919,510

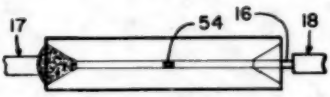
OPTICAL FIBER CONNECTOR AND METHOD

Duane E. Hoke, Corning; Ronald L. Kimball, and David E. Quinn, both of Painted Post, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed May 4, 1989, Ser. No. 344,611

Int. Cl.[5] G02B *6/38*

U.S. Cl. 350—96.21 **58 Claims**



36. An optical fiber splice comprising

a tube having first and second opposite ends and a bore which extends longitudinally therethrough, at least a portion of said tube being sufficiently transparent to permit the viewing of said bore therethrough, mean at both ends of said bore for facilitating the insertion of optical fibers into said bore, and liquid residue venting means associated with said bore,

first and second optical fibers disposed substantially coaxially within said tube with their endfaces adjacent one another, and

index matching substance disposed between said optical fibers and in said venting means, said index matching substance containing a visibility enhancing agent.

4,919,511

FIBRE-TYPE LIGHT CONVERSION DEVICE

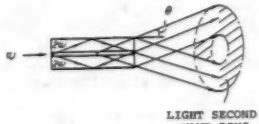
Seiichi Ohsawa, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

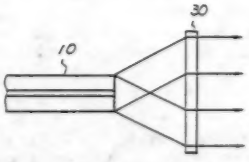
Filed Aug. 24, 1989, Ser. No. 397,912

Claims priority, application Japan, Feb. 3, 1989, 1-26477; Feb. 13, 1989, 1-34643

Int. Cl.[5] G02F *1/37*

U.S. Cl. 350—96.29 **8 Claims**





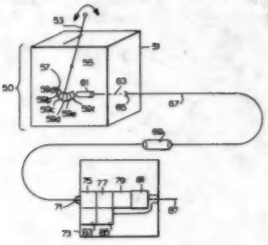
1. A fibre-type light conversion device comprising a fibre-type light conversion element for converting the wavelength of an incident light beam, and a converting means for converting said incident light into a parallel light, said incident light having been converted in frequency by said fibre-type light conversion element, wherein a holographic element having a complex transparency varying periodically with respect to the distance from its optical axis, is used as said converting means.

4,919,512

WAVELENGTH SHIFT SWITCH AND SENSING SYSTEM

Bruce W. Flaherty, Hemit, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Oct. 17, 1988, Ser. No. 258,557
Int. Cl.[5] G02B 6/02
U.S. Cl. 350—96.29 30 Claims



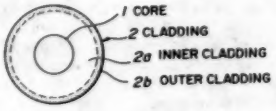
1. A wavelength shift switch and sensing system comprising:
a optic fiber having a first end and a second end;
a fluorescent surface optically aligned and controllably and relatively movable with respect to said first end of said optic fiber;
an optical transmitter connected to, and in optical alignment with said second end of said optical fiber; and,
an optical sensor connected to, and in optical alignment with said second end of said optical fiber.

4,919,513

PLASTIC OPTICAL FIBER

Noboru Nakakuki; Kazuhide Oda; Masatoshi Tagami; Kouichi Okino; Tomiya Abe, and Takanobu Ishibashi, all of Ibaraki, Japan, assignors to Hitachi Cable, Ltd., Tokyo, Japan

Filed Nov. 3, 1988, Ser. No. 266,707
Claims priority, application Japan, Mar. 9, 1988, 63-55605
Int. Cl.[5] G02B 6/22
U.S. Cl. 350—96.33 5 Claims



2. A plastic optical fiber, comprising:
a transparent core of a thermosetting resin having a first refractive index;
a transparent inner cladding layer of a first thermoplastic resin formed on the outer periphery of said core and having a second refractive index which is lower than said first refractive index;
a non-transparent outer cladding layer of a second thermoplastic resin including a coloring and opaque material, formed on the outer periphery of said inner cladding layer and having a third refractive index which is lower than said first refractive index, said inner and outer cladding layers being formed by simultaneous extrusion of said first and second thermoplastic resins to provide a composite cladding tube having a firmly unified interface between said inner and outer cladding layers with said core being formed by pressure-charging of said thermosetting resin in liquidized form into said composite cladding tube and polymerization thereafter of said thermosetting resin in the same composite cladding tube.

4,919,514

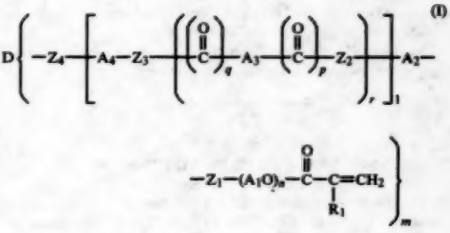
OPTICAL FIBRES BASED ON POLYCARBONATE FIBRES, AND A PROCESS FOR THE PRODUCTION THEREOF

Wolfgang Ebert, Krefeld; Wilfried Haese, Monchen-Gladbach; Roland Vogelsgesang, Leverkusen, and Rolf Dhein, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 5, 1989, Ser. No. 294,079
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1988, 3801576
Int. Cl.[5] G02B 1/04
U.S. Cl. 350—96.34 10 Claims

6. An optical fibre based on an aromatic polycarbonate comprising a polycarbonate fibre coated by an irradiation polymerized mixture of

(A) 25 to 75% by weight, based on the total weight of the polymerisable compounds, of a polyfunctional (meth)acrylic acid derivative of the formula



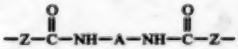
in which

m is 2, 3 or 4,

D is the m-valent radical of an aliphatic or aromatic hydrocarbon,

R_1 is hydrogen or methyl,

Z_1, Z_2 and Z_3, independently of one another, are oxygen, sulphur, the —N(R)— group (in which R is hydrogen, alkyl, substituted alkyl, aralkyl, substituted aralkyl, aryl or substituted aryl or a divalent radical of the formula

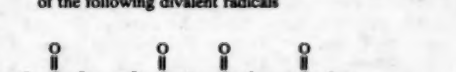


in which

Z is oxygen, sulphur or the —N(R)— group, and

A is a divalent radical of an aliphatic, cycloaliphatic, araliphatic or aromatic hydrocarbon or a substituted divalent radical of an aliphatic, cycloaliphatic, araliphatic or aromatic hydrocarbon,

Z_4 is oxygen, the divalent radical of the formula (II) or one of the following divalent radicals



A_1, A_2, A_3 and A_4, independently of one another, are a divalent radical of an aliphatic, cycloaliphatic, araliphatic or aromatic hydrocarbon or a substituted divalent radical of an aliphatic, cycloaliphatic, araliphatic or aromatic hydrocarbon,

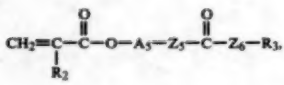
n is zero or an integer from 1 to 20,

p, q and r, independently of one another, may adopt the value zero or 1, and

l has a numerical value such that the molecular weight of the

polyfunctional (meth)acrylic acid derivative of the formula (I) is 450 to 5000,

(B) 75 to 25% by weight, based on the total weight of the polymerisable compounds, of a monofunctional (meth)acrylate of the formula



(III)

in which

R_2 is hydrogen or methyl,

A_5 is a divalent radical or a substituted divalent radical of an aliphatic or cycloaliphatic hydrocarbon,

Z_5 and Z_6, independently of one another, are oxygen, sulphur or the —N(R')—group in which R' is H or alkyl, substituted alkyl, aralkyl, substituted aralkyl, aryl or substituted aryl, and

R_3 is alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, aralkyl or substituted aralkyl, and

(C) 0.1 to 10% by weight, based on the total weight of the polymerisable compounds, of a photoinitiator.

4,919,515

SCREEN FOR A REAR PROJECTION TYPE TELEVISION SET

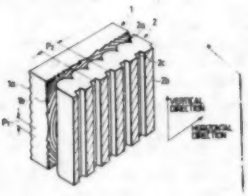
Shinichi Hasegawa, and Masaaki Hanyu, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 9, 1988, Ser. No. 242,948

Claims priority, application Japan, Feb. 19, 1988, 63-35364

Int. Cl.[5] G03B *21/60*

U.S. Cl. 350—128 **12 Claims**



1. A screen for a rear projection type television set, comprising:

a Fresnel sheet for receiving a projection image from a projector, said Fresnel sheet including a plurality of first lenticular lenses, spherical or aspherical in profile, formed on an incident surface of said Fresnel sheet and arranged in a first direction, and a Fresnel lens formed on an emergent surface of said Fresnel sheet;

a lenticular sheet, disposed adjacent to said Fresnel sheet, including a plurality of second lenticular lenses formed on an incident surface of said lenticular sheet and arranged in a second direction perpendicular to said first direction, and a plurality of black stripes arranged on an emergent surface of said lenticular sheet and having the same pitch and being arranged in the same direction as said second lenticular lenses; and

said first lenticular lenses meeting the following conditions:

$$0.10 \leq Z/H \leq 0.37$$

where Z/H is a ratio of a half period (H) of said first lenticular lenses to a lenticular depth (Z) of said first lenticular lenses.

4,919,516

OPTICAL TANDEM SCANNING SYSTEM USING A KOESTERS REFLECTING PRISM FOR LIGHT SPLITTING

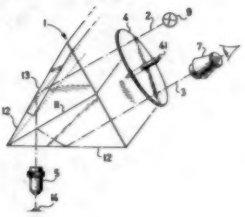
Mojmír Petrán, and Milan Hadravsk , both of Plzen, Czechoslovakia, assignors to Jednotne Zemedelske Druzstvo "Vitezny Unor" Se Sidlem V Komorne, Blovice, Czechoslovakia

Filed Jul. 18, 1988, Ser. No. 220,172

Claims priority, application Czechoslovakia, Jul. 24, 1987, 5595-87

Int. Cl.[5] G02B *23/04*

U.S. Cl. 350—171 **5 Claims**



1. In a device for optical tandem scanning of an object having an arrangement for illumination and scanning of an object by means of a rotating scanning disk having diametrically opposed, spirally arranged elementary openings and an axis of rotation, and a light splitting system, and wherein an illuminating light ray is passed through a first elementary opening in said rotating disk and passed into said light splitting system whereby a portion of said light ray is passed therethrough and through an objective to the object, and an image light ray is reflected from said object back through said objective to said light splitting system wherein said light splitting system will reflect a portion of said image light ray through a second elementary opening on said disk, and then passed to where an image of said object can be viewed;

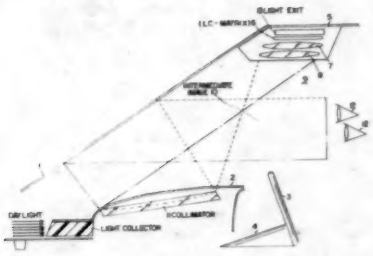
the improvement comprising a light splitting system comprising a Koesters reflecting prism of the type having an interface between a first and second component part thereof, wherein each component part has a first surface perpendicular to said interface and a second surface at an acute angle to said interface, said prism having a semi-transparent mirror coating at said interface and oriented such that said interface is parallel to said axis of rotation of said disk, and said illuminating light rays enter said first component part of said prism through said first surface thereof and parallel to said interface, and then reflected from said second surface and out of said prism and through said objective and to said object, and the image light rays are reflected from said object back through said objective and into said second component part of said prism through said second surface thereof and a portion thereof reflected from said interface back to said second surface of said second component part, and there reflected to pass parallel to said interface and emerge from said prism through said first surface of said second component part, and such that all light rays entering and emerging from said prism enter and emerge perpendicularly through said first and second surfaces.

4,919,517

IMAGE-REPRODUCING ARRANGEMENT FOR MOTOR VEHICLES INCLUDING LENS MEANS FORMING A REAL IMAGE ADJACENT AN UPPER EDGE OF A WINDSHIELD TO WHICH AN INSTRUMENT PANEL MIRROR REFLECTS TO FORM A VIRTUAL IMAGE

Michael Jost, Unterschleissheim, and Walter Weishaupt, Munich, both of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Oct. 17, 1988, Ser. No. 258,852
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1987, 3735124
Int. Cl.[5] G02B *27/10, 17/08*
U.S. Cl. 350—174 19 Claims



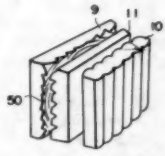
1. An image-reproducing arrangement for motor vehicles with a windshield and an instrument panel, in which a real image is represented as a virtual image in the field of vision of a vehicle user, comprised of lens means forming said real image, the real image and the lens being located adjacent the upper edge of the windshield, and mirror means for reflecting the real image to the windshield to provide said virtual image, said mirror means being arranged within an area of a surface of the vehicle's instrument panel between the lens means and the windshield.

4,919,518

MULTI-SCREEN PROJECTOR

Masanori Ogino, Yokohama; Hiroshi Kaiwa, Tokyo; Yoshiaki Iwahara, Yokosuka; Yuzo Tamura, and Akio Yamamoto, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 14, 1989, Ser. No. 338,208
Claims priority, application Japan, Apr. 15, 1988, 63-91369
Int. Cl.[5] G03B *21/60*
U.S. Cl. 350—128 45 Claims



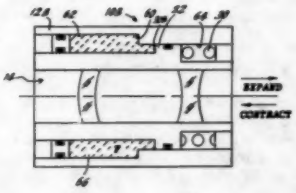
1. A multi-screen projector comprising
a plurality of unit module projectors piled up one upon another at least in the vertical direction, each of said unit module projector comprising:
light projection means for projecting a light;
a screen including Fresnel lens means and lenticular means, said light projected from said light projection means being incident to said Fresnel lens means and outputted from said lenticular means; and
control means for controlling the vertical directivity range of said light to be outputted from said screen so as to match a view point of an audience viewing said screen at the position remote from said screen by a predetermined distance,
wherein said control means includes prism means having a predefined prism angle, said prism means being mounted between said Fresnel lens means and lenticular means, and said prism angle being set larger for said screen which is required to be viewed from said view point at a larger angle of elevation or depression than that for said screen which is required to be viewed at a smaller angle of elevation or depression.

4,919,519

FLUID THERMAL COMPENSATION SYSTEM

Louis R. Fantozzi, Pelham, and James P. Hopkins, Nashua, both of N.H., assignors to Diversified Optical Corp., Farmingdale, N.Y.

Filed Sep. 29, 1988, Ser. No. 250,865
Int. Cl.[5] G02B *7/02*
U.S. Cl. 350—253 11 Claims

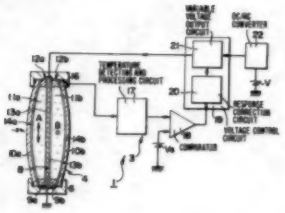


8. A system for adjustably locating a lens as a function of an ambient temperature of the lens, comprising:
a housing which defines a radial direction and an axial direction;
a lens mount which is movable in an aperture in said housing in said axial direction, said lens being mounted in said lens mount;
an axially extending chamber defined between a radial surface of a radially extending portion of said housing and a radial surface of a radially extending portion of said lens mount; and
a fluid accommodated in said chamber, said fluid having variable volume as a function of said temperature, such that the distance between said two radial surfaces, and thereby the location of said lens, is variable as a function of the temperature of said fluid.

4,919,520
LIQUID CRYSTAL EYEGLASS

Takao Okada, Hachioji; Takeaki Nakamura, Hino; Kazuo Nakamura, Hachioji; Kimihiko Nishioka, Hachioji; Toshihito Kouchi, Tama; Hiroyuki Yamamoto, Hachioji, and Hideo Tomabechi, Higashiyamato, all of Japan, assignors to Olympus Optical Company, Japan

Continuation of Ser. No. 770,051, Aug. 27, 1985, Pat. No. 4,795,248. This application Nov. 18, 1988, Ser. No. 273,238
Claims priority, application Japan, Aug. 31, 1984, 59-183087; Aug. 31, 1984, 59-183088; Aug. 31, 1984, 59-183091; Aug. 27, 1985, 60-219839
The portion of the term of this patent subsequent to Jan. 3, 2006, has been disclaimed.
Int. Cl.[5] G02F *1/13*
U.S. Cl. 350—331 T 23 Claims



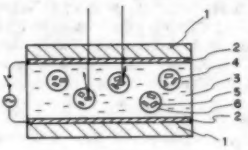
1. A liquid crystal eyeglass comprising:
an eyeglass frame having a frame portion for at least partially surrounding a lens;
at least one lens assembly supported within said frame portion having a predetermined effective aperture and including a liquid crystal having a refractive index which varies as a result of a change in the orientation of molecules of a liquid crystal responsive to the application of an external voltage;
means for detecting the temperature of the liquid crystal comprising a temperature sensor disposed upon the portion of the frame surrounding said lens assembly and outside of said predetermined effective aperture, said detecting means further including temperature detecting and processing means for generating a compensating signal;
comparison means for generating a differential signal representing a deviation of said compensating signal from a known signal value; and
voltage control means for controlling the voltage applied to the liquid crystal responsive to a control output from the comparison means, for controlling the orientation of the liquid crystal to compensate for a change in the refractive index of the liquid crystal due to a change in temperature.

4,919,521
ELECTROMAGNETIC DEVICE

Hiroaki Tada, Nishinomiya; Harunobu Yoshida, Amagasaki; Hideo Kawahara, Mino, and Kunio Miyata, Nishinomiya, all of Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Jun. 2, 1988, Ser. No. 203,797
Claims priority, application Japan, Jun. 3, 1987, 62-139450; Aug. 4, 1987, 62-195061; Aug. 28, 1987, 62-214643; Nov. 11, 1987, 62-284990
Int. Cl.[5] G02F *1/01*
U.S. Cl. 350—362 4 Claims

1. An electromagnetic device comprising:
(a) a solid matrix layer;
(b) micro-capsules containing a suspension of anisotropic particles being dispersed in the solid matrix layer;
(c) a means for applying an electric field or a magnetic field to the anisotropic particles, said means comprising a pair of electrodes, at least one of which is a transparent electrode; and
(d) the surface of the anisotropic particles being made of a

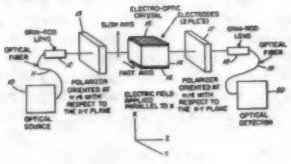


mixed valence complex represented by the general formula of $M_{1x}[M_2(CN)_6]_y$ wherein M_1 and M_2 are at least one transition metal, and x and y satisfy the relationship of $3 \leqq x \leqq 4$ and $2 \leqq y \leqq 3$ respectively.

4,919,522
OPTICAL SWITCH HAVING BIREFRINGENT ELEMENT

Bruce N. Nelson, South Boston, Mass., assignor to Geo-Centers, Inc., Newton Centre, Mass.

Filed Feb. 25, 1988, Ser. No. 160,126
Int. Cl.[5] G02F *1/03*; G02B *5/30*
U.S. Cl. 350—389 18 Claims



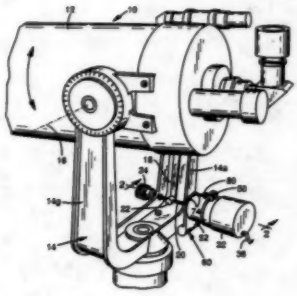
1. An electrically controlled optical switch comprising:
(i) an electro optical crystal of the kind exhibiting birefringence in each of two different light paths when disposed in angularly oriented electric fields and wherein each light path is sensitive to a different one of the two electric fields and has its own set of fast and slow axes,
(ii) means for separately establishing each of the angularly oriented electric fields with the crystal within the influence of the established electric field,
(iii) first and second polarizer means disposed at opposite ends of the crystal in alignment with one of the light paths in the crystal,
(iv) third and fourth polarizer means disposed at opposite ends of the crystal in alignment with the other light path in the crystal,
(v) a beam splitter disposed adjacent one end of the crystal in alignment with one of the light paths in the crystal, one of the polarizer means being disposed between the crystal's end and the beam splitter, and
(vi) an angular reflector disposed in alignment with the other light path in the crystal, the angular reflector being adjacent the beam splitter and at the same end of the crystal therewith, the angular reflector being disposed to reflect light into the beam splitter and the beam splitter being arranged to reflect light toward the angular reflector, and one of the polarizers in said other light path being disposed between the crystal's end and the angular reflector.

4,919,523

TELESCOPE MOTORIZED DRIVE ATTACHMENT

James D. Burr, 1960 Jefferson Co. Rd. 23, Evergreen, Colo. 80439

Filed Apr. 17, 1989, Ser. No. 339,083
Int. Cl.[5] G02B 23/16, 7/00; H02R 5/02
U.S. Cl. 350—567 5 Claims



1. A motorized drive attachment for installation with the rotatable control shaft of a telescope, the shaft protruding from a frame portion of the telescope and the attachment comprising:

a motor and a motor housing enclosing the motor, the motor including a drive shaft projecting from the housing,

a bracket and means for securing the bracket to the frame portion of the telescope,

a pair of mounting elements with axially extending hollow centers, one being slidably and removably mounted on the other for relative movement in a path extending axially of the elements, one mounting element being secured to the motor housing with said drive shaft extending through its hollow center and the other mounting element being secured to said bracket with the control shaft extending through its hollow center, and

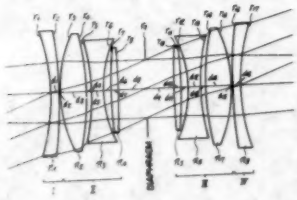
a coupler mountable on one of the shafts for engagement with the other of the shafts for rotatably coupling the two shafts.

4,919,524

VARIABLE FOCUS LENS FOR IMAGE REPRODUCTION

Hiroichi Shinohara, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 13, 1989, Ser. No. 337,555
Claims priority, application Japan, Apr. 13, 1988, 63-90894
Int. Cl.[5] G02B 9/00
U.S. Cl. 350—450 1 Claim



1. A variable focus lens for use in image reproduction, comprising:

first, second, third, and fourth lens groups arranged successively from an object to an image; and

a diaphragm disposed between the second and third lens groups;

said first lens group comprising a concave meniscus lens with its concave surface facing the object;

said second lens group comprising a double convex lens with the larger absolute value of the radius of curvature of its surface facing the image, a double concave lens with the larger absolute value of the radius of curvature of its surface facing the object, and a double convex lens, said lenses of the second lens group being arranged successively in the order named from the object;

said third lens group being of the same construction as the second lens group except that the lenses of the third lens group are arranged and faced in the opposite direction to said second lens group, said second and third lens groups being positioned symmetrically with respect to said diaphragm;

said fourth lens group comprising an lens identical to the lens of said first lens group and faced in the opposite direction to said first lens group, said first and fourth lens groups being positioned symmetrically with respect to said diaphragm;

said first and fourth lens groups and the diaphragm being fixed, said second and third lens groups being movable, said first through fourth lens groups being positioned symmetrically with respect to said diaphragm at an equal-size magnification ratio;

said second and third lens groups being movable symmetrically or asymmetrically for varying the magnification ratio to move the lenses along an optical axis thereby to keep an object-to-image distance constant;

said variable focus lens meeting the following conditions:

$$0.56f<f_2=f_3<0.91f \quad \text{(I)}$$

$$44.8<\nu_1=\nu_8<62.0 \quad \text{(II)}$$

$$0.28f<r_6<0.34f \quad \text{(III)}$$

$$0.0155f<d_6<0.0261f \quad \text{(IV)}$$

$$-1.40<b/a<-0.67 \quad \text{(V)}$$

where f represents the combined focal length of the variable focus lens, f_2, f_3 the focal lengths of the second and third lens groups, respectively, ν_j ($j=1\sim8$) the Abbe number of the jth lens from the object, r_i ($i=1\sim17$) the radius of curvature of the ith surface from the object (with the diaphragm surface counted), d_i ($i=1\sim16$) the ith surface-to-surface distance from the object, and a, b the distances, respectively, that the second and third lens groups move from the equal-size magnification ratio position to the minimum magnification ratio position (the movement toward the image is positive and the movement toward the object is negative).

4,919,525

BREAK-AWAY MIRROR MECHANISM

Robert Gilbert, Lonsdale, Australia, assignor to Britax Rainsfords Pty. Ltd., Lonsdale, Australia

Filed May 5, 1989, Ser. No. 347,989
Claims priority, application Australia, May 5, 1988, PI8062
Int. Cl.[5] B60R 1/06
U.S. Cl. 350—604 5 Claims

1. A rear vision mirror of a motor vehicle, comprising:

(a) a mounting bracket having:

(i) an outer face with a front edge and a rear edge with respect to said vehicle,

(ii) a pair of vertically spaced guide projections projecting from the outer face near said rear edge,

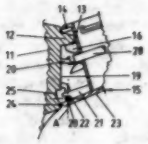
(iii) a hinge member which has a hinging axis near said front edge and spaced outwardly away from the outer face, and

(iv) a ramp surface adjacent the hinge member, and

(b) a mirror assembly including a mirror case having:

(i) a front wall with an inner surface and an outer surface, the front wall having a support projection which rides over the ramp surface upon forward break-away,

(ii) hinging means adjacent said front wall inner surface, said hinging means having notches defined by surfaces thereof which engage over the hinge member, and



(iii) pivoting surfaces so located as to engage said guide projections upon rearward break-away of the mirror assembly from the mounting bracket,

wherein the mirror assembly breaks away from the mounting bracket upon impact, in a direction which is either forward or rearward with respect to the vehicle.

4,919,526

ELECTRICALLY SWINGABLE DOOR MIRROR

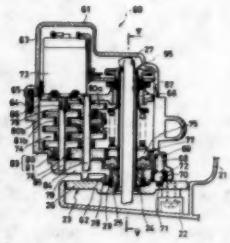
Akihiko Umekawa, Sagamihara, and Yoshihiko Ishiyama, Isehara, both of Japan, assignors to Ichikoh Industries Ltd., Tokyo, Japan

Filed Oct. 27, 1988, Ser. No. 263,313

Claims priority, application Japan, Oct. 27, 1987, 62-163208; Nov. 30, 1987, 62-181161; Nov. 30, 1987, 62-181162; Nov. 30, 1987, 62-181163; Nov. 30, 1987, 62-181164

Int. Cl.[5] G02B 5/08

U.S. Cl. 350—604 **6 Claims**



1. A door mirror of the electrically swingable type comprising a base fixed to a door of a vehicle, a center shaft nonrotatably attached to the base, a mirror housing pivoted on and rotated round the center shaft, a mirror housed in the mirror housing in such a way that its angle can be adjusted in the mirror housing, a sun gear attached to the center shaft, and a driver system having a planet gear engaged with the sun gear to swing the mirror housing relative to the base through the sun gear;

wherein said mirror housing is supported at both ends of the center shaft by intermediate and bottom walls of a case in which the drive system in the mirror housing is housed;

wherein said case in which the driver system is housed has a cylindrical bearing section which is projected from the bottom of the case and rotatably fitted onto a cylindrical shaft section erected from the base, a ring-shaped groove is formed on the inner face of the cylindrical bearing section at the lower end thereof, an O-ring is fitted into the groove, closely contacting the outer circumference of the cylindrical shaft section, and a washer is then attached to the open side of the groove from below.

4,919,527

SOLAR RADIATION CONCENTRATOR

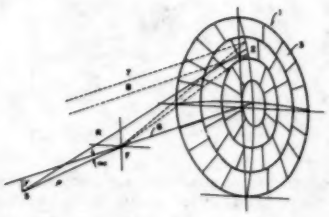
Nurmamed Salylov, ulitsa Kotovskogo, 19, Korpus, 2, kv. 35, and Shaakhmed A. Nazarov, ulitsa 50 let TSSR, 23a, kv. 40, both of Ashkhabad, U.S.S.R.

PCT No. PCT/SU86/00029, § 371 Date Nov. 19, 1987, § 102(e) Date Nov. 19, 1987, PCT Pub. No. WO87/06012, PCT Pub. Date Oct. 8, 1987

PCT Filed Mar. 31, 1986, Ser. No. 163,976

Int. Cl.[5] G02B 5/08

U.S. Cl. 350—613 **1 Claim**



1. A solar radiation concentrator comprising a supporting frame (1) and facets (2) having a toroidal reflecting surface and arranged in annular zones (3), the reflecting surfaces of the toroidal annular zones (3) being formed by turning arcs of a circle 4 about an optical axis (6) of the concentrator upon rotation of the arc of the circle (4) by an angle $0.5|\psi|$ in a meridian plane, the geometrical coordinates of the center of a curvature (5) of the said circle (4) arc being determined in space by the parameters α, ρ which are calculated by the formulae

$$\tan\alpha = \frac{(1 + 2\cos\Delta)\sin W_c - \sin 3W_c + 2|\psi|\cos 3W_c}{(1 + 2\cos\Delta)\cos W_c - \cos 3W_c - 2|\psi|\sin 3W_c}$$

$$\rho = M \cdot R$$

wherein:

$$M = \frac{\sqrt{\cos^2\Delta + (1 + 2\cos\Delta)(\sin^2 W_c - |\psi|2W_c}}{2\cos\Delta\cos\frac{\Delta}{2}}$$

and wherein the parameters of the toroidal annular zones 3 W_b, W_h, R, Δ are calculated by the formulae

$$W_b = \frac{Um + |\psi|}{2}$$

$$W_H = W_b - \left(K + \frac{1 + T^2}{47} + \frac{15 - 77T^2 + 37T^4}{967^2} \cdot K^3 + \frac{(1 + T^2)(12 - 177T^2)}{967^3} \cdot K^4 \right)$$

wherein:

$$T = \tan(W_b - |\psi|); \; K^2 = \frac{8|\psi|}{37}$$

-continued

$$\Delta = W_b - W_H, R = \frac{r_b}{\sin W_b - M\sin\alpha}; r_b = \frac{D_k}{2}$$

ensure the focusing of two beams (7, 8) from the center of the solar disk to the projected focus F and the rest of beams—below and above the projected focus F—within the limits of allowance $|\psi|$,

wherein, the parameters ρ, α, R, Y, W_h, W_b, K, T, $r_b\Delta$, and M stand for:

ρ is the distance from the focus F of the concentrator to the center of curvature 5 of the circle 4 arc;

R is the radius of curvature of the facet in the meridian plane;

M is the value of ρ/R;

Y is the distance from the optical axis 6 to the center of curvature 5 of the circle 4 arc;

α is the angle between the optical axis of the concentrator and ρ;

W_h, W_b are respectively the lower and upper boundaries of the annular zones 3;

K is a coefficient

$$\frac{8|\psi|}{3T};$$

T is the parameter $T=\tan(W_b-|\psi|)$;

Δ is the difference of W_b and W_h;

D_k is diameter of concentrator,

whereby a maximum concentration in the focus of the concentrator is obtained with the maximum width of the annular zones (3).

4,919,528

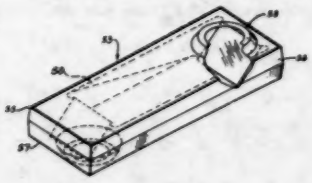
BORESIGHT ALIGNMENT VERIFICATION DEVICE

Stephen K. Pitalo, Huntsville; Donnie T. Walden, Cullman, and Henry P. Lay, Huntsville, all of Ala., assignors to The Boeing Company, Seattle, Wash.

Division of Ser. No. 97,331, Sep. 11, 1987, Pat. No. 4,762,411. This application Jul. 29, 1988, Ser. No. 225,939

Int. Cl.[5] G02B 5/10, 23/08

U.S. Cl. 350—620 **8 Claims**



1. A reflective periscope for two-way light transmission comprising:

a one-piece reflector set including an elongated base having opposed ends, a flange extending from each side end generally perpendicular to said base, each said flange including a reflective surface in opposed, substantially parallel relation to the reflective surface of the other flange and defining an optical path for translating light between substantially parallel paths proximate respective ends of said base, said base having an opening proximate one end for passage of one of said parallel paths of light; and

a cover enclosing said reflector set, said cover including opposed generally planar plates disposed in generally parallel relation on opposite sides of said reflector set and a side wall extending around the periphery of said reflector set and joining said plates, each said plate having an opening for passage of a respective one of said parallel paths of light.

4,919,529

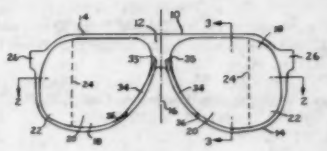
REAR VIEW MIRROR SUNGLASSES

Kwang H. Hyun, 914 S. Ardmore Ave., Los Angeles, Calif. 90006

Filed Feb. 24, 1989, Ser. No. 314,774

Int. Cl.[5] G02C 7/14

U.S. Cl. 351—50 **10 Claims**



1. A pair of eyeglasses comprising:

an eyeglass frame having a central bridge section, and two lens-support sections extending in opposite directions from said bridge section;

a lens supported on each support section, each lens having a transparent forward-viewing section in near proximity to the central bridge section, and a rearward-viewing mirror section located outboard from the associate forward-viewing section;

said frame having two forwardly-extending walls located at the inboard edges of the two lenses:

whereby when the person wearing the glasses is viewing one of the mirror sections the other forwardly-extending wall blocks the person's view through the other forward-viewing.

4,919,530

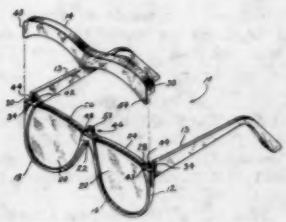
EYEGLASS ASSEMBLY

Roger L. Hyman, 5249 N. 35th St., Milwaukee, Wis. 53209

Filed Jan. 25, 1989, Ser. No. 301,820

Int. Cl.[5] G02C 1/00, 5/02

U.S. Cl. 351—85 **3 Claims**



1. An eyeglass assembly comprising:

a lower lens holding frame member having a pair of lens receiving members connected at and disposed on each side of a centrally located nose piece, said lens receiving members defining an upwardly extending opening through which the lens may be inserted into said frame

a pair of bridge pieces spanning each of said openings and connecting said nose piece to an outer portion of said lens receiving member

an upper brow member provided with a groove for receiving said bridge pieces

connector means for releasably connecting said brow member to said lower lens holding frame, said connector means

comprising a plurality of pin receiving holes in one of said upper brow member or said lower frame member and a plurality of pins extending from the other of said members

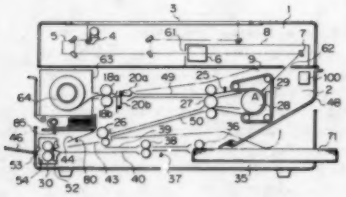
a right temple piece extending rearwardly from the right edge portion of one of said upper brow member or lower frame member and

a left temple piece extending rearwardly from the left edge portion of one of said upper brow member or lower frame member.

4,919,531
IMAGE REPRODUCING DEVICE

Harumitsu Mashiko, Tokyo; Takashi Seto, Ayase, and Shigeru Suzuki, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 30, 1988, Ser. No. 277,948
Claims priority, application Japan, Dec. 1, 1987, 62-301603
Int. Cl.[5] G03B 27/32
U.S. Cl. 355—27 **25 Claims**



1. A control device for an image reproducing device wherein said reproducing device includes a photosensitive film cartridge, a transfer sheet cassette and a developer pod receptacle, each mounted separately, and where a peel-apart type film is used, said control device comprising:

a first sensor for sensing a first code indicative of the type of the photosensitive film and applied to the photosensitive film or the photosensitive film cartridge;

a second sensor for sensing a second code indicative of the kind of the transfer sheet and applied to the transfer sheet or the transfer sheet cassette;

a third sensor for sensing a third code indicative of the kind of the pod and applied to the pod or the pod receptable; and

means for inhibiting the operation of the device when at least two of the sensed first, second and third codes do not agree with each other.

4,919,532
HIGH ACCURACY SEMICONDUCTOR LASER DOPPLER VELOCIMETER

Hans W. Mocker, 2215 Newton Ave. S., Minneapolis, Minn. 55405, and Paul E. Bjork, 358 Flowerfield Rd., Circle Pines, Minn. 55014

Filed Aug. 15, 1988, Ser. No. 232,406
Int. Cl.[5] G01P 3/36; H01S 3/082
U.S. Cl. 356—28.5 **12 Claims**

1. A high accuracy semiconductor laser Doppler velocimeter comprising:

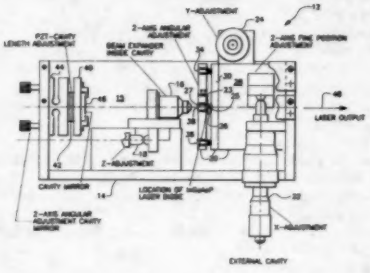
an external cavity semiconductor laser for generating a first light beam, wherein said external cavity semiconductor laser comprises:

an active internal cavity having first partially reflecting mirror means at a first end of said internal cavity, having second partially reflecting mirror means at a second end of said internal cavity, and having said first and second partially reflecting mirror means parallel to each other; and

a passive external cavity having said active internal cavity at a first end and having a fully reflecting mirror at a second end of said external cavity, wherein said active internal cavity and the fully reflecting mirror are positionally alignable for generating the first light beam having a narrow linewidth;

a polarized beam splitter for passing said first light beam;

a dual-functional fractional wavelength plate for receiving said first light beam, reflecting a second light beam, transmitting a third light beam to a target, receiving said third light beam from the target and transmitting a fourth light beam;



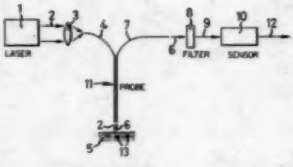
said polarized beam splitter for receiving and reflecting said second and fourth light beams; and

a detector for receiving said second and fourth light beams, comparing said fourth light beam with said second light beam, and determining a velocity of the target.

4,919,533
METHOD FOR DETECTING DIAMONDS IN REMOTE LOCATIONS

Heather J. Bowley, Middlesex; Donald L. Gerrard, Surrey, and John E. Preedy, Kent, all of England, assignors to The British Petroleum Company plc, London, England

PCT No. PCT/GB88/00187, § 371 Date Nov. 15, 1988, § 102(e) Date Nov. 15, 1988, PCT Pub. No. WO88/07213, PCT Pub. Date Sep. 22, 1988
PCT Filed Mar. 10, 1988, Ser. No. 275,146
Claims priority, application United Kingdom, Mar. 18, 1987, 8706421
Int. Cl.[5] G01V 9/04; G01N 21/65
U.S. Cl. 356—30 **15 Claims**



1. A method for detecting diamonds in locations which are not easily accessible, the method comprising (a) irradiating material suspected of containing diamonds in a location which is not easily accessible, with laser radiation at a pre-determined wavelength, the laser radiation being provided by irradiating means which is adapted for access to the location and the laser radiation being capable of causing Raman radiation to be scattered from diamonds in the material, (b) collecting the scattered Raman radiation by a collecting means adapted for access to the location, (c) passing the collected Raman radiation through a filtering means adapted to pass only Raman radiation characteristic of diamonds, and (d) sensing the filtered Raman

radiation by a sensing means adapted to produce a signal whenever radiation characteristic of diamonds is sensed, whereby the absence or the presence of diamonds in the location is indicated.

4,919,534

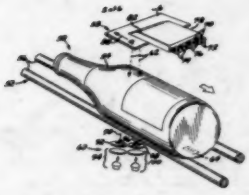
SENSING OF MATERIAL OF CONSTRUCTION AND COLOR OF CONTAINERS

Michael A. Reed, Greenland, N.H., assignor to Environmental Products Corp., Del.

Filed Sep. 30, 1988, Ser. No. 251,559

Int. Cl.[5] G01J 3/50; G01N 21/21, 21/27

U.S. Cl. 356—73 **17 Claims**



1. Apparatus for analyzing the character of a light transmitting container, comprising:

a container support adapted for supporting a container;

a first source of beam of polarized light of a first wavelength disposed to direct the beam of polarized light through the container supported in the container support;

a second source of a beam of polarized light of a second wavelength disposed to direct the beam of polarized light through the container supported in the container support;

a first light analyzer having

a parallel polarizer relative to the polarization of the light from the first source, the parallel polarizer being disposed to intercept a first portion of the beam from the first source of polarized light after the beam has passed through the container,

a cross polarizer relative to the polarization of the light from the first source, the cross polarizer being disposed to intercept a second portion of the beam from the first source of polarized light after the beam has passed through the container,

a first detector that measures the intensity of a light beam, the first detector being disposed to detect the first portion of the beam from the first source, after the beam has passed through the parallel polarizer, and

a second detector that measures the intensity of a light beam, the second detector being disposed to detect the second portion of the beam from the first source, after the beam has passed through the cross polarizer;

a second light analyzer having

a parallel polarizer relative to the polarization of the light from the second source, the parallel polarizer being disposed to intercept a first portion of the beam from the second source of polarized light after the beam has passed through the container,

a cross polarizer relative to the polarization of the light from the second source, the cross polarizer being disposed to intercept a second portion of the beam from the second source of polarized light after the beam has passed through the container,

a first detector that measures the intensity of a light beam, the first detector being disposed to detect the first portion of the beam from the second source, after the beam has passed through the parallel polarizer, and

a second detector that measures the intensity of a light beam, the second detector being disposed to detect the second portion of the beam from the second source, after the beam has passed through the cross polarizer;

means for analyzing the character of the container using the intensities measured by the first light analyzer and the second light analyzer.

4,919,535

REFLECTANCE MEASURING APPARATUS FOR MAKING CONTACTLESS MEASUREMENTS

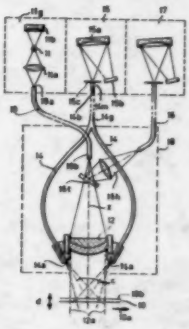
Gerhard Hohberg, Aalen-Dewangen, and Hermann Gerlinger, Aalen-Ebnat, both of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

Filed Jan. 22, 1988, Ser. No. 147,226

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1987, 3701721

Int. Cl.[5] G01N 21/86, 21/47

U.S. Cl. 356—429 **27 Claims**



1. A reflectance measuring apparatus for making contactless measurements on a surface of a structured sample moving in a given direction past the apparatus and disposed at a spacing from the apparatus, the level of the surface of the sample fluttering within a predetermined distance range (d) by which said spacing is increased or decreased, the apparatus comprising:

an illuminating device disposed at an optically unobstructed spacing from the sample for illuminating an irradiated area on said surface of the sample;

a measuring device for detecting radiation reflected from said surface;

said illuminating device and said measuring device conjointly defining a common central axis transverse to said surface;

said measuring device including at least three radiation receivers having respective optical axes and mounted to cause said optical axes to lie on at least one conical surface concentric with said central axis with each two mutually adjacent ones of said receivers being spaced from each other by a predetermined azimuth angle whereby the contactless measurement is independent of the orientation of the structured sample with respect to said measuring apparatus;

said illuminating device including parallel beam means for producing and directing a bundle of parallel illuminating rays onto said surface so as to define an optically unobstructedly illuminated core area (k) wherein the intensity of illumination is independent of the spacing of said surface from said illumination device within said distance range (d); and,

said radiation receivers including aperture means for limiting the bundle of said rays detected by said receivers to those rays which are received in a spatial angle defining a detected region (m) on said surface smaller than said core

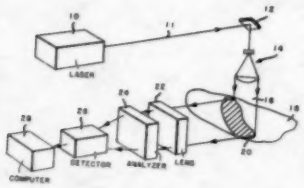
area (k) for movements of said sample within said predetermined distance range (d), said spatial angle being constant thereby causing the received radiation to be independent of said spacing so long as the movement of said sample remains within said distance range (d).

4,919,536

SYSTEM FOR MEASURING VELOCITY FIELD OF FLUID FLOW UTILIZING A LASER-DOPPLER SPECTRAL IMAGE CONVERTER

Hiroshi Komine, Torrance, Calif., assignor to Northrop Corporation, Hawthorne, Calif.

Filed Jun. 6, 1988, Ser. No. 203,360
Int. Cl.[5] G01P *3/36*; G01N *21/00*
U.S. Cl. 356—28.5 **32 Claims**



1. A system for measuring the velocity of a fluid flow field comprising:

laser means for generating a monochromatic laser beam;

a member for supporting said fluid flow field;

a plurality of particles seeded into the fluid flow field and having the property that they flow along therewith;

means for directing said laser beam to said fluid flow field in a manner such that a plane of said fluid flow field is illuminated by a light beam of a predetermined thickness and width, the illuminated plane yielding scattering due to those of said particles in the illuminated plane, said scattered light yielding a frequency shift relative to the frequency of said laser beam due to the Doppler effect;

optical means positioned outside of the region of said fluid flow field for collecting scattered light therefrom and for producing an image whose frequency spectrum contains two-dimensional velocity field information;

detector means responsive to said image for providing a radiation intensity output which corresponds to said image; and

an analyzer disposed between the optical means and the detector means and including a frequency-to-intensity converter for converting Doppler frequency shifted frequencies received from the moving particles into intensity variations in said image said analyzer containing a medium including a uniformly dispersed atomic or molecular species the absorption of which varies significantly as a function of frequency over the range of frequency shifts which result from the Doppler effect caused by movement of said particles so that the image intensity in said image is caused to vary by said absorption as a unique function of the velocity of movement of said particles.

4,919,537

UV SCANNING SYSTEM FOR CENTRIFUGE

Robert Giebeler, Cupertino, Calif., assignor to Beckman Instruments Inc., Fullerton, Calif.

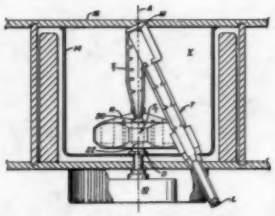
Continuation-in-part of Ser. No. 115,023, Oct. 29, 1987, Pat. No. 4,830,493. This application Feb. 10, 1989, Ser. No. 309,507
Int. Cl.[5] G01J *3/24, 3/42*
U.S. Cl. 356—328 **7 Claims**

1. A method for optically detecting stratification in a sample while said sample is being spun in a centrifuge, said method comprising the steps of:

placing said sample in a chamber in a centrifuge rotor spun about an axis, said chamber in said rotor having at least two windows for permitting light to pass through the sample parallel to centrifuge produced stratification at a point of observation;

providing a light source for observing said sample through said windows while said sample is being spun by said centrifuge rotor;

providing a toroidal mirror having a first substantially cylindrical radius of curvature for collimating light from said light source parallel to the axis of said rotor only whereby the collimated light passes parallel to said strata and a second radius of curvature intersecting said first radius of curvature;



ruling said toroidal mirror with respect to said second radius of curvature to chromatically classify light to differing frequencies at differing angularities from said mirror;

rotating said mirror with respect to said first radius of curvature to maintain collimation and select color of light incident upon said sample;

providing an optical head for receiving an image of said sample parallel to the axis of said rotor and normal to the radius of said rotor at said chamber;

providing relay optics for relaying an image of said sample to the optical head;

providing a slit parallel to the plane of said image;

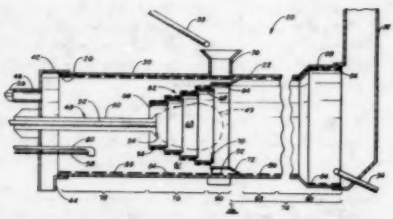
and detecting and receiving said light after passage through said chamber at said slit to determine location of stratification by optical absorption in said sample.

4,919,538

DRUM MIXER HAVING A COMBINED MIXING AND HEATING ZONE

George W. Swisher, Jr., 1500 Dorchester Dr., Oklahoma City, Okla. 73120

Filed Jul. 26, 1989, Ser. No. 385,556
Int. Cl.[5] B28C *5/46*
U.S. Cl. 366—4 **34 Claims**



21. In a method for continuously producingan asphaltic composition comprising the following steps:

creating a flame in a combustion chamber within an inclined rotating drum between a first end and a second end of the drum for generating a first stream of hot gases therein and for generating radiant heat within the combustion chamber;

creating an annulus within the drum substantially overlying the combustion chamber such that a portion of the radiant heat generated within the combustion chamber enters the annulus;

introducing a first volume of material into the first end of the drum, wherein the first volume of material flows through the annulus towards the second end of the drum;

heating the first volume of material with the first stream of hot gases;

introducing a second volume of material into the annulus;

mixing the first and second volumes of material within the annulus; and

discharging the mixture of the first and second volumes of material at the secondn end of the drum.

4,919,539

KNEADING MACHINE, PARTICULARLY FOR FOOD PRODUCTS

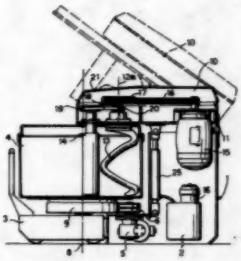
Amabile Drocco, Alba, Italy, assignor to Jacobacci-Casetta & Perani, Turin, Italy

Filed Jul. 5, 1989, Ser. No. 375,734

Claims priority, application Italy, Jul. 5, 1988, 53277/88[U]

Int. Cl.[5] B28C *1/16*

U.S. Cl. 366—94 **4 Claims**



1. Kneading machine for food products, particularly flour mixtures, comprising:

a kneading bowl (4) which is rotatable about a first substantially vertical axis (8),

a kneading tool (13) which is rotatable within the kneading bowl (4) around a second substantially vertical axis (12*a*), spaced from the first axis (8),

a counter-member (14) supported within the bowl (4) and separated therefrom, for creating a dough-free space in the center of the bowl (4) when the dough is rotated by the bowl (4), characterized by the combination of the following features:

the counter-member (14) has a body having a continuous peripheral wall and is rotatable around a third substantially vertical axis, said kneading machine further comprising means for rotating the counter-member (14) so that the peripheral velocity of the counter-member (14) is equal to the peripheral velocity of the bowl (4) in correspondence with the part of the counter-member (14) which is farthest from the axis of rotation (8) of the bowl (4),

the kneading machine comprises at least one further kneading tool (13) which is rotatable around a forth substantially vertical axis.

4,919,540

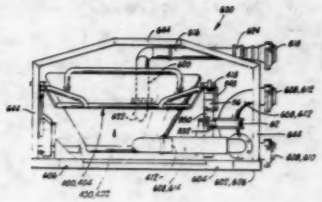
SELF-LEVELING MIXER APPARATUS

Calvin L. Stegemoeller, and Gail F. Davis, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed May 27, 1988, Ser. No. 199,983

Int. Cl.[5] B01F *15/02, 5/16;* B28C *7/04;* G05D *9/02*

U.S. Cl. 366—132 **13 Claims**



1. A self-leveling mixer apparatus, comprising:

a base;

a generally downwardly tapered, movable mixing tub supported from said base in a manner such that said tub is movable between first and second positions relative to said base, said generally downwardly tapered tub having a generally oval-shaped upper end and a generally circular-shaped lower end and said tub being tapered around at least most of a perimeter thereof along at least most of a vertical height thereof;

leveling valve means for controlling a level of fluid in said movable mixing tub; and

connector means, operably associated with said mixing tub and said leveling valve means, for adjusting said leveling valve means in response to movement of said mixing tub relative to said base.

4,919,541

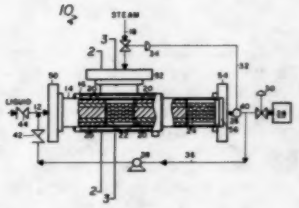
GAS-LIQUID MASS TRANSFER APPARATUS AND METHOD

Fritz Grosz-Roell, Zurich, Switzerland; Michael Mutsakis, Brooklyn, N.Y., and Robert G. Rader, Wichita, Kans., assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Apr. 7, 1986, Ser. No. 849,002

Int. Cl.[5] B01F *3/04, 5/06;* G05D *11/02*

U.S. Cl. 366—136 **24 Claims**



1. A direct contact gas-liquid mass transfer apparatus, which apparatus comprises:

(a) a housing;

(b) a conduit within said housing which conduit defines an axial flow path for a liquid stream, the conduit having an inlet, an outlet and a plurality of peripherally spaced openings positioned generally perpendicular to and along the length of the axial flow path;

(c) motionless mixing means composed of one or more mixing elements in the said axial flow path;

(d) means to introduce a liquid stream into the inlet;

(e) means to introduce the gas stream through the plurality of openings and into and generally peripherally about the motionless mixing means and along substantially the length of the motionless mixing means and radially into the axial flow path containing the liquid stream for a rapid mixing of the gas and liquid streams to provide a mixed liquid product stream, the gas stream introduced at a gas-liquid volume ratio of about 2 to 1 or greater; and

(f) means to withdraw a mixed liquid product stream from the outlet.

10. A direct contact method for the rapid mixing of a liquid and gas stream in a conduit having a motionless mixer, which method comprises:

(a) flowing a liquid stream along a defined axial flow path in a conduit;

(b) introducing a gas stream into the liquid stream at a gas-liquid volume ratio of greater than 2 to 1 generally perpendicularly and peripherally about the axial flow path of the liquid and the motionless mixer in the conduit; and

(c) continuously subdividing the gas and liquid steam in the conduit and along the axial flow path by said motionless mixer to provide for the rapid mixing of said gas and liquid streams in the axial flow path; and

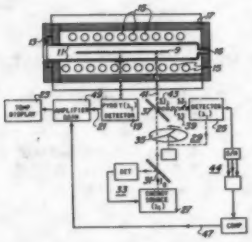
(d) withdrawing from the axial flow path a mixed product stream.

4,919,542

EMISSIVITY CORRECTION APPARATUS AND METHOD

Jaim Nulman, Palo Alto; Nick J. Bacile, San Jose, and Wendell T. Blonigan, Sunnyvale, all of Calif., assignors to AG Processing Technologies, Inc., Sunnyvale, Calif.

Filed Apr. 27, 1988, Ser. No. 186,558
Int. Cl.[5] G01J *5/10*; G01N *25/00*
U.S. Cl. 374—9 **6 Claims**



1. A method for measuring the emissivity of a remote object within a chamber including a boundary wall of quartz in the presence of ambient radiation supplied thereto through the quartz boundary wall, the method comprising the steps of:

detecting through the quartz boundary wall the radiation within a selected waveband from a selected location on the remote object that is heated to elevated temperature by the radiation supplied thereto through the quartz boundary wall;

supplying radiation within the selected waveband through the quartz boundary wall to the selected location on the object;

measuring the radiation reflected through the quartz boundary wall from the selected location on the object of the supplied radiation; and

logically combining indications of the detected radiation and the measured reflected radiation to provide an output indication of the emissivity of the remote object.

5. Apparatus for measuring the emissivity of a remote object that is within a chamber including a boundary wall of quartz and that is heated to elevated temperatures by radiation supplied thereto through the quartz boundary wall, the apparatus comprising:

first detection means disposed to detect through the quartz boundary wall the spectral radiation emanating from a selected location on the remote object at elevated temperature for generating output signals representative of the detected radiation within a selected waveband;

source means of radiation disposed to supply radiation of selected intensity within the selected waveband through the quartz boundary wall to the selected location on the object;

second detection means disposed for measuring the intensity of the radiation from the source means reflected from the selected location on the object; and

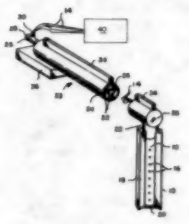
circuit means coupled to receive the output signals from said first and second detection means for producing therefrom an output that is representative of the emissivity at elevated temperature of the remote object.

4,919,543

MOLTEN METAL TEMPERATURE PROBE

Dennis W. Davis, Lawrence County, Tenn.; Ray D. Peterson, Florence, and Walter Posey, Jr., Lauderdale County, both of Ala., assignors to Reynolds Metals Company, Richmond, Va.

Filed Jun. 20, 1988, Ser. No. 208,612
Int. Cl.[5] G01K *13/00*
U.S. Cl. 374—139 **10 Claims**



1. A temperature probe for use in molten metal comprising a refractory body, said refractory body having a surface along its length, a plurality of thermocouple wire pairs cast in place within said refractory body as said refractory body is formed, said wire pairs having their first ends protruding from the surface of said refractory body and formed into thermocouple junctions at varying points along the length of said probe and outside of the surface of said probe, said junction being in direct contact with said molten metal during use to thereby provide a plurality of temperature measurement points along the length of said probe, said wire pairs having their other ends protruding from said refractory body thereby providing a plurality of temperature inputs to a temperature measuring means, and boom means for positioning said probe comprising a pipe embedded in said refractory body, a support pipe to which said pipe is connected and a positioning means.

4,919,544

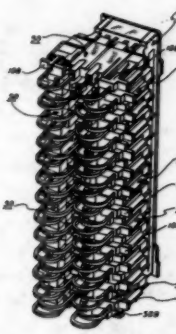
RETROFIT TELEPHONE NETWORK INTERFACE APPARATUS

Thomas G. Graham, Ocean, N.J., assignor to Keptel, Inc., Tinton Falls, N.J.

Filed Jan. 5, 1989, Ser. No. 293,948
Int. Cl.[5] H04M *1/00*
U.S. Cl. 379—399 **13 Claims**

1. Retrofit apparatus for being mounted on a telephone terminal block previously mounted at a subscriber's premises and for providing at least one demarcation point at said telephone terminal block between an incoming telephone line and a subscriber premises line previously interconnected through

first terminal means provided on said telephone terminal block, said terminal block provided with a plurality of said first terminal means disposed in a row, comprising telephone jack means for being connected to said first terminal means; second terminal means for being connected to said subscriber premises line upon said subscriber premises line being disconnected from said incoming telephone line; telephone plug means connected to said second terminal means and for being plugged into said telephone jack means to interconnect said incoming telephone line and said subscriber premises line and for being unplugged from said telephone jack means to provide said demarcation point and permit the plug of an operating telephone to be



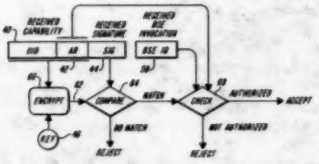
plugged into said telephone jack means to facilitate determination of whether a fault exists on said incoming telephone line or said subscriber premises line; said telephone plug means having a predetermined width and said retrofit apparatus having a width substantially equal to said predetermined width of said telephone plug means, said telephone jack means having opposed open sides, said retrofit apparatus having predetermined portions whereby upon a plurality of said retrofit apparatus being mounted on said telephone terminal block in a row with adjacent ones thereof being displaced laterally with respect to each other, said predetermined portions of said retrofit apparatus close said opposed open sides of said jack means to protect telephone plug means plugged therein against disturbance.

4,919,545

DISTRIBUTED SECURITY PROCEDURE FOR INTELLIGENT NETWORKS

Che-Fn Yu, Chelmsford, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 22, 1988, Ser. No. 288,779
Int. Cl.[5] H04K *1/00*; G07D *7/00*
U.S. Cl. 380—25 **7 Claims**



5. In an intelligent network having at least two nodes, a method for maintaining security when a process in a first node requests access to an object located in a second node, comprising the steps of:

transmitting a request for access to the object from the first node to the second node with a capability and a signature, said capability including a unique identifier of the object and access rights to the object;

at the second node, encrypting the capability received from the first node with an encryption key associated with the first node to form a test signature; and

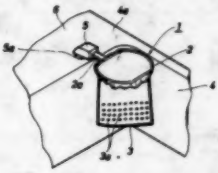
authorizing access to the object only when the test signature matches the signature received from the first node.

4,919,546

TRASH BAG WITH HOLDER AND DISPOSABLE REFILL TRASH BAG

Yukio Imazeki, Tokyo, and Hideo Yamaguchi, Chiba, both of Japan, assignors to D-Three Co., Ltd., Tokyo, Japan

Filed Aug. 2, 1988, Ser. No. 227,669
Claims priority, application Japan, Aug. 4, 1987, 62-119553[U]; Sep. 4, 1987, 62-221447; Nov. 26, 1987, 62-298372
Int. Cl.[5] B65D *33/14*
U.S. Cl. 383—33 **19 Claims**



1. A trash bag and support in combination, comprising:

said support having an open fixed shape frame having a bag engaging periphery of a first perimeter from engaging an interior wall portion of the bag;

said bag having a non-elastic bag body having a first circumference greater than said first perimeter and an opening of a fixed second circumference less than said first circumference;

said frame including means for passing said frame through said opening into the bag interior, said means being portions of said frame oppositely disposed along said periphery having a fixed minimum dimension extending therebetween;

said perimeter of said bag engaging periphery being greater than said second circumference of said bag opening for supporting the bag adjacent said opening from the wall portion of the bag when said frame is disposed in the interior of the bag; and

said bag being a trash bag having a number of perforations formed therein, and said bag support frame having means for fixing said support frame to a sink.

4,919,547

DYNAMICALLY SELF-ADJUSTED FLUID BEARING

Everett H. Schwartzman, Plaza Del Amo, Unit #309, Torrance, Calif. 90503

Continuation-in-part of Ser. No. 301,459, Jan. 25, 1989, which is a division of Ser. No. 35,627, Apr. 3, 1987, abandoned. This application May 5, 1989, Ser. No. 347,996
Claims priority, application European Pat. Off., Mar. 31, 1988, 88302975.3; Japan, Apr. 4, 1988, 63-82826
Int. Cl.[5] F16L *32/06*
U.S. Cl. 384—110 **12 Claims**

1. A self-adjusting fluid operating bearing system for operation at relatively high rotational speeds, comprising:

housing means containing rotatingly driven shaft means,

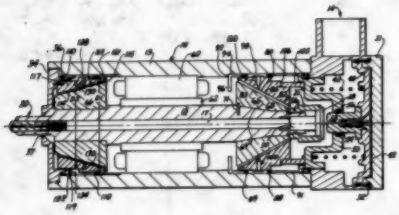
at least first and second spaced bearing elements each having an outer conical surface thus forming an end having a major and a minor diameter and mounted for rotation with said driven shaft means,

shell means cooperating with each of said first and second conical bearing elements and being mounted within said housing means and each including an outer surface, and an inner conical surface facing the outer conical surface of the associated bearing elements and forming a gap therebetween,

low friction seal means cooperating with said shell means for resiliently mounting said shell means with respect to said housing means,

means to effect flow of fluid into said gap between each said bearing element and the associated shell means,

means biasing one of said shell means towards the major diameter of the associated bearing element,



the other shell means including at least a portion of the outer surface which has a differential diameter so as to provide an area on which fluid may act to create a force urging said other shell axially in said housing,

means to flow fluid into contact with said portion of the outer surface of said shell which has said differential diameter, and

said force operating on the said area of said other shell means being operative to urge the latter in an axial direction towards the major diameter of the cone associated with said associated shell means whereby the said gaps between said shell means and the associated bearings are automatically self-adjusting in gap dimension.

4,919,548

DRAWER GUIDE

Lautenschläger Horst, Reinheim, Fed. Rep. of Germany, assignor to Karl Lautenschläger GmbH & Co. KG, Reinheim, Fed. Rep. of Germany

PCT No. PCT/EP88/00077, § 371 Date Sep. 23, 1988, § 102(e) Date Sep. 23, 1988, PCT Pub. No. WO88/05639, PCT Pub. Date Aug. 11, 1988

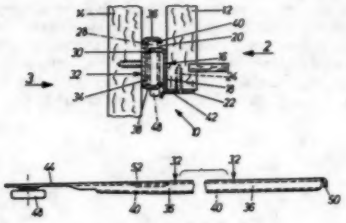
PCT Filed Feb. 3, 1988, Ser. No. 274,057

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1987, 3703051

Int. Cl.[3] A47B *88/14*

U.S. Cl. 384—19 **7 Claims**

1. A drawer guide for drawers and other such extendable furniture parts, having a guide rail adapted to be fastened to a wall of a cabinet carcase, and a runner rail adapted to be fastened to an extendable furniture part, said rails being displaceable lengthwise relative to one another on two wheels, one of said wheels being mounted on a front end of the guide rail and running on the runner rails the other wheel being mounted on a back end of the runner rail and running on the guide rail, the guide rail being in the form of a channel with a web affixed to a cabinet wall and having two flanges projecting away from the web beyond the wheel of the runner rail and curling slightly around the safe to form two edges, while a flange forming a track of the runner rail overreaches and slightly curls around the top of the wheel of the guide rail, the free width measure between the web and the edges curling around the runner rail wheel of at least one of the flanges the guide rail, gradually diminishing outwardly from the carcase interior toward the fully extended position of the drawer guide in an



area thereof traveled by the runner rail wheel as the same approaches the fully extended position.

4,919,549

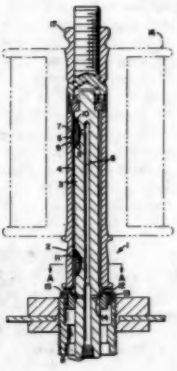
HYDROSTATIC SPINDLE

James L. Lawson, Simsbury, and Ronald A. Peterson, Norfolk, both of Conn., assignors to The Torrington Company, Torrington, Conn.

Filed Jan. 30, 1989, Ser. No. 303,371

Int. Cl.[5] F16C *32/06*

U.S. Cl. 384—113 **10 Claims**



1. A spindle comprising:

an outer sleeve;

a non-rotating shaft disposed within said outer sleeve;

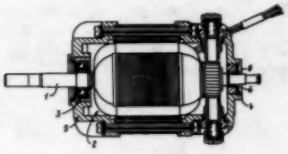
swing-type bearing pads made of metal-elastomer laminated structure containing a metal layer and an elastomeric layer disposed between said outer sleeve and said non-rotating shaft, said bearing pads being attached to said non-rotating shaft; and

a lubricating means for introducing a lubricant between said outer sleeve and said bearing pads, said lubricating means comprising a primary lubricating hole disposed in said non-rotating shaft and secondary lubricating holes disposed between said primary lubricating hole and said bearing pads, such that a lubricant may pass from said primary lubricating hole through said secondary lubricating holes to a clearance space formed between said outer sleeve and said bearing pads.

4,919,550
BEARING ASSEMBLY

Herman Lankamp, Bunnik, Netherlands, assignor to SKF Industrial Trading & Development Company, B.V., Vinhann, Netherlands Antilles

Continuation-in-part of Ser. No. 92,122, Sep. 2, 1987, abandoned. This application Oct. 20, 1988, Ser. No. 260,405
Claims priority, application Netherlands, Sep. 16, 1986, 8602343
Int. Cl.[5] F16C *33/82*
U.S. Cl. 384—133 1 Claim

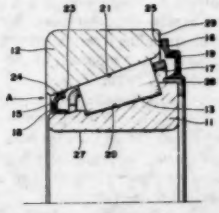


1. The combination of an electric motor having a housing and a shaft rotatably mounted in the housing and a bearing means for rotatably supporting the shaft comprising means defining a bearing sleeve made predominantly of a non-magnetic synthetic material circumscribing the shaft and forming the running surface of the bearing and a small quantity of lubricant film between the running surface of the sleeve and the shaft, means for retaining the lubricant comprising magnetic means consisting of particles of magnetic material embedded in the sleeve in a predetermined array so that the force of attraction for the lubricant is greater at the shaft than in the magnetically permeable environment structure surrounding the sleeve, whereby a lubricant film of relatively small axial width relative to the width of the sleeve is supported in place and the sleeve forms a barrier between the lubricant and the outside environment tending to influence the lubricant.

4,919,551
BEARING WITH IMPROVED LUBRICATION SEALS

Masao Nunotani, and Masaaki Matsumoto, both of Osaka, Japan, assignors to Koyo Seiko Co., Ltd., Osaka, Japan

Filed Jan. 26, 1989, Ser. No. 301,941
Claims priority, application Japan, Jan. 26, 1988, 63-15586
Int. Cl.[5] F16C *33/78*
U.S. Cl. 384—482 4 Claims



1. A tapered roller bearing, comprising:
an inner ring having a race surface comprised of a tapered face and a small diameter portion and a large diameter portion;
an outer ring having a race surface comprised of a tapered face;
a plurality of tapered rollers which roll on said race surface of said inner ring and said race surface of said outer ring;
a cage which retains said tapered rollers at even intervals in the circumferential direction of said bearing;
a first seal comprised of a lip and a lip supporting element, said lip supporting element being mounted on the small diameter end portion of said inner ring, said lip being urged in an axial outward direction of said bearing against said outer ring and separated from said outer ring when said lip is forced in the axial inward direction; and
a second seal comprised of a further lip and a further lip supporting element, said further lip supporting element being mounted on the large diameter end portion of said inner ring, said further lip being urged in the axial inward direction of said bearing against said outer ring and separated from said outer ring when said lip is forced in the axial outward direction.

4,919,552
MACHINE BEARING

Rua H. Ongari, Sao Paulo, Brazil, assignor to Industria Plastica Ramos S.A., Brazil

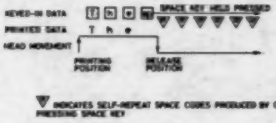
Filed Jun. 27, 1988, Ser. No. 211,979
Int. Cl.[5] F16C *33/32*
U.S. Cl. 384—492 1 Claim

1. A low maintenance machine bearing which does not use grease or any lubricants and is suitable for use in the submarine, chemical, photographic or other industries, said bearing comprising:
A. a nylon, PTFE, or acetalic resin central shaft which defines an inner bearing race;
B. a nylon, PTFE, or acetalic resin external cover means which defines an outer bearing race;
C. a circular array of unlubricated glass balls regularly positioned in said races between said shaft means and said cover means; and
D. polyamide or polyacetate spacer means located between said shaft means and said cover means for spacing said balls regularly along said races.

4,919,553
PRINTER HAVING HEAD RELEASE MECHANISM RESPONSIVE TO SPACE COMMANDING CODES

Hideo Ueno, Nagoya; Satoshi Shibata, and Keiko Yamada, both of Aichi, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Filed May 16, 1988, Ser. No. 194,279
Claims priority, application Japan, May 19, 1987, 62-122223
Int. Cl.[5] B41J *3/20*
U.S. Cl. 400—120 4 Claims



1. A printing apparatus comprising:
a print head movable between a printing position thereof in which the print head is in pressed contact with a recording medium via a print ribbon, and a release position thereof in

which the print head is spaced apart from the recording medium;

ribbon feeding means including a ribbon supply section and a ribbon take-up section, said ribbon feeding means being operable while said print head is placed in said printing position, for feeding an active portion of said print ribbon past said print head from said ribbon supply section toward said ribbon take-up section, said ribbon feeding means being inoperable while said spring head is placed in said release position;

data input means including a space key for feeding said print head by a distance equal to a printing pitch, without a printing action, when said space key is held in an operated position for less than a predetermined operating time, and for feeding said print head continuously by a distance equal to a multiple of said printing pitch, without the printing action, while said space key is held in said operated position for more than said predetermined operating time;

head release means for moving said print head from said printing position to said release position; and

head-release control means for inhibiting said head release means from operating to move said print head to said release position if said space key is held in said operated position for less than said predetermined operating time, and for commanding said head release means to operate to move said print head to said release position to thereby disable said ribbon feeding means, if said space key is held in said operated position for more than said predetermined operating time wherein said head-release control means comprises:

a print buffer for temporarily storing data as the data is entered through said data input means, and outputting said data in the order of entry thereto;

memory control means responsive to an operation of said space key, for storing a space code in said print buffer, and storing a self-repeat code in said print buffer if said operation of the space key continues for more than said predetermined time; and

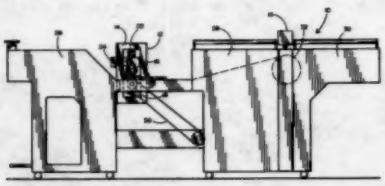
executing means for sequentially executing codes stored in said print buffer, said executing means executing said space code without commanding said head release means to move said print head to said release position, and executing said self-repeat code while commanding said head release means to move said print head to said release position.

4,919,554

CRUSH ROLLER ASSEMBLY FOR A SCREEN PROCESS PRINTING MACHINE

George H. Force, Huntington Beach, Calif., assignor to Ernst W. Dorn Co., Inc., Gardena, Calif.

Filed Feb. 13, 1989, Ser. No. 309,140
Int. Cl.[5] B41K *35/00*
U.S. Cl. 400—419 **6 Claims**



1. In a screen process printing machine a crush roller apparatus comprising:

a pair of selectively engageable adjacent crush roller oriented on parallel axes;

a pair of brush rollers, each such brush roller having brush bristles in contact with the radial surface of a respective crush roller for wiping the surface of the crush roller,

a housing for enclosing said crush rollers and said brush rollers,

a frame supporting said housing, said crush rollers and said brush rollers on said screen process printing machine in a location for crushing agglomerated powder on sheets being fed to said machine for printing;

a pair of fixed blocks supporting the axial ends of one of said crush rollers and a pair of slideable blocks supporting the axial ends of the other of said crush rollers for sliding engagement with said frame; and

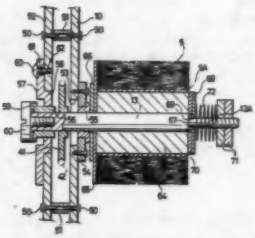
a selectively enabled actuator for sliding said slideable blocks toward and away from said fixed blocks whereby said crush rollers are selectively engaged and disengaged with respect to one another.

4,919,555

CARBON RIBBON SUPPLY APPARATUS FOR A PRINTER

Hidenori Kikuchi, Iwate, Japan, assignor to Kabushiki Kaisha Sato, Japan

Filed Jun. 3, 1988, Ser. No. 202,704
Claims priority, application Japan, Jun. 9, 1987, 62-88128[U]
Int. Cl.[5] B41J *33/56*
U.S. Cl. 400—224.2 **12 Claims**



1. A printer, comprising:

a frame;

a print head and a platen for urging a carbon ribbon against the print head;

means for supplying a carbon ribbon and for guiding the carbon ribbon against the print head, the carbon ribbon supplying means including a carbon ribbon supply spindle defined about an axis and mounted to and extending generally perpendicularly to the frame;

means for supporting the spindle cantileverly on the frame, the frame including a first frame part and a second frame part generally parallel to and spaced from the first frame part, the spindle being supported at a first predetermined location in the first frame part and at an adjustable location on the second frame part; and

means for adjusting the orientation of the axis of the carbon ribbon supply spindle relative to the frame in a manner which is effective for preventing wrinkling of the carbon ribbon, the spindle adjusting means being located on the second frame part and including a rotatable adjusting plate disposed on and extending generally parallel to the second frame part and a spindle bearing mounted to the adjustment plate, a distal end of the spindle being received in the spindle bearing and the spindle bearing being so located on the adjusting plate that the rotation of the adjusting plate is effective to vary the orientation of the axis of the spindle relative to the first frame part.

4,919,556
WRITING IMPLEMENT HAVING SIMPLIFIED LEAD-FEEDING MECHANISM

Chun-Liang Kuo, Taipei, Taiwan, assignor to Pencell Co., Ltd., Taipei, Taiwan

Continuation-in-part of Ser. No. 144,814, Jan. 15, 1988. This application Sep. 29, 1988, Ser. No. 252,567
Int. Cl.[5] B43K 21/16
U.S. Cl. 401—57 5 Claims

1. A writing implement comprising an elongated annular outer casing (1), an inner tube (2) slidably mounted within said outer casing, and a plurality of pre-sharpened leads (3) stacked in axial alignment within said tube;

said outer casing comprising an annular molded plastic member having first and second end sections; said first end section being configured as a frusto-conical head; a V-shaped slot extending through the wall of said head to form an axially elongated resilient leg (12) integral with the head; said resilient leg having a cantilever connection with the associated head wall, and a free end spaced a short distance axially from the end edge of the head; and a hook section (121) extending generally radially inwardly from the free end of said leg, said hook section being integral with the leg;

said resilient leg having a normal unstressed position wherein its outer side surface lies in the outer surface plane of the frusto-conical head, with the hook section extending radially inwardly to the casing axis; said reilient leg having a stressed position wherein its outer side surface projects outwardly beyond the outer surface plane of the frusto-conical head;

said inner tube having a led-gripper end section adapted to move between a retracted position extending a relatively short distance out of said frusco-conical head, and an extended position projecting a relatively great distance beyond said frusto-conical head; a relatively long axial slot (23) formed in said tube end section; and a relatively short axial groove (24) formed in the outer surface of said tube end section at a point diammetrically opposite said axial slot; said groove having sufficient depth as to permit the semi-circular wall sections formed by said groove to resiliently deflect for gripment of a sharpened lead projecting beyond the tube end section; said tube being oriented within said casing so that the hook section of the resilient leg extends into the slot when said tube lead-gripper end section is in its retracted position whereby said hook section is located between the projecting and the remaining leads within the tube.

4,919,557
LOOSELEAF BINDER WITH SLIDING LOCK MECHANISM

Edward Podosek, Wilbraham, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed Oct. 14, 1988, Ser. No. 257,658
Int. Cl.[5] B42F 13/20, 3/04, 13/16, 5/00
U.S. Cl. 402—41 20 Claims

1. A loose-leaf binding mechanism, of the type affixed to covers and a backbone structure, comprising:

a coverplate adapted to be affixed to a backbone structure and having an upper wall extending the length of said coverplate and spaced apart from the backbone structure;

a pair of hook plates, each hook plate pivotally coupled to said coverplate for movement between a first position with said hook plates positioned in proximity to said coverplate and a second position with said hook plates positioned distally from said cover plate, said hook plates including an aperture;

ring binding means having two opposing portions, each of said opposing portions affixed to opposite hook plates in cooperating relationship to open and close with the movement of said hook plates;

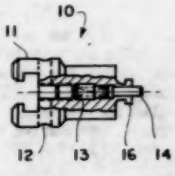
locking slide slidably affixed in said coverplate, movable between a first locking slide position at which the locking slide projects from one end of the backbone, and a second locking slide position at which the locking slide does not substantially project from such end;

wherein said locking slide includes a body portion which is slidable between the hook plates and the backbone, and a cam arm which extends through the hook plate aperture as the locking slide moves between the first locking slide position and the second locking slide position, said cam arm having a wedge portion which is configured to wedge between the hook plates and the coverplate when the hook plates are in their second position only when the locking slide is at or near its first locking slide position, to prevent the pivotting of said hook plates to their first position and the opening of the ring binding means.

4,919,558
PIPE CLEANING HEAD ADAPTER

Edmund J. Mascitelli, 601 SE. 23 Ave., Pompano Beach, Fla. 33062, and Douglas J. Riggs, 1731 Mistletoe, Sebastain, Fla. 32958

Filed Jan. 3, 1989, Ser. No. 293,016
Int. Cl.[5] B25G 3/00
U.S. Cl. 403—9 2 Claims



1. An adapter for connecting a pipe cleaning cable to a cleaning head of differing size including:

a generally tubular member having an cable retaining end and an opposite cleaning head retaining end;

said cleaning head retaining end having a spring loaded axially aligned retaining pin that mates with a corresponding passage in said cleaning head;

said retaining pin being rigidly surrounded by a T-shaped retainer bar, said T-shaped retainer bar mating with a corresponding slot on said cleaning head; and

said cable retaining end is wider than said cleaning head retaining end and has an open-ended slot that runs normal to the axis of said tubular member, said open-ended slot accepting in a mating fashion a T-shaped bar on the end of said cleaning cable, said cable retaining end having an axially aligned depression disposed on the surface of said open-ended slot to accept in mating fashion a retaining pin on said cleaning cable.

4,919,559

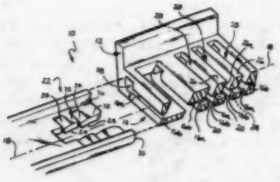
LOCKING ASSEMBLY

Ernest L. Belleville, Barrington, N.H., assignor to Davidson Textron Inc., Dover, N.H.

Filed Jan. 5, 1989, Ser. No. 293,763

Int. Cl.[5] B25G *3/14*; F16D *1/10*

U.S. Cl. 403—13 **14 Claims**



1. A locking assembly (10) comprising;

a female member (12) having a receiving cavity (14) formed by first and second spaced walls (16*a*, 16*b*) extending along a receiving axis (18),

said female member defining a plurality of locking recesses (20) spaced along said axis on said first spaced wall (16*a*) of said cavity (14),

a male member (22) having a plurality of tines (24) spaced apart longitudinally therealong for snapping into said recesses (20) to retain said male member (22) in said cavity (14),

said assembly (10) characterized by said female member (12) having a plurality of biasing means (26) independent from one another and axially spaced from each other along said second spaced wall of said cavity (14) and separated by spaced openings through said second spaced wall for locating each of said biasing means to respectively engage only one of said tines (24) when the male member is fully inserted to retain each tine (24) locked in one of said recesses (20).

4,919,560

OIL WELL SUCKER ROD

Woodrow T. Rutledge, Jr.; Russell P. Rutledge; T. Mike Jones; Don E. McCown, and J. Tom Hodnett, all of Big Spring, Tex., assignors to Fiberglass Technologies, Inc., Big Spring, Tex.

Filed Apr. 28, 1989, Ser. No. 344,673

Int. Cl.[5] F16B *11/00*

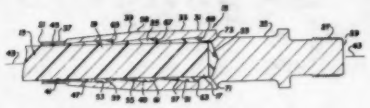
U.S. Cl. 403—268 **9 Claims**

1. An oil well sucker rod, comprising:

an elongated, cylindrical rod;

a connector attached to one end of the rod for connecting the rod to another rod and having a rod-receiving receptacle, the receptacle having an open end, a closed end, and a plurality of axially spaced, annular, tapered surfaces;

an annular, tapered centering surface within the receptacle in engagement with the end of the rod for centering the rod axially within the connector;



a plurality of dimples on the connector extending into the receptacle to contact the rod for centering the rod within the connector at a point spaced from the centering surface; and

an adhesive bonding material within the receptacle for securing the connector to the rod.

4,919,561

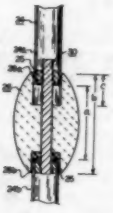
CERAMIC FITTING FOR TUBULAR FURNITURE CONSTRUCTION

Peter M. Y. Kee, Flat 1002, Block A, 10th Floor, Lotto Villa 18 Broadwood Road, Happy Valley, Hong Kong

Filed Mar. 20, 1989, Ser. No. 325,669

Int. Cl.[5] A47C *19/00*; F16D *1/00*

U.S. Cl. 403—305 **8 Claims**



1. An ornamental knob-like fitting adapted to be attached to and removed from a seated position between two axially aligned, substantially fixed, confronting tubular members without disassembly of the fitting itself, said tubular members being spaced apart a distance less than the axial length of said knob-like fitting, at least one of said tubular members being capable of flexing to a position where said members are not axially aligned, whereby, when finally seated and connected between the tubular members, the knob-like fitting envelops both ends of the confronting tubular members, said knob-like fitting comprising:

(a) a unitary body member of a prescribed shape having a first end and a second end and an axial dimension extending collinearly with the longitudinal axis of said two confronting tubular members and a diameter greater than the diameter of said tubular members;

(b) a rod member extending axially through said unitary body member and secured therein;

(c) a first and second well surrounding said rod in said first and second ends of said body member respectively;

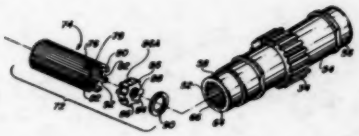
(d) said first well having a depth dimension at least as great as the difference between the axial dimension of said fitting and said distance between said confronting tubular members, whereby said first end may be positioned on the corresponding end of one of said tubes and moved to a point which exceeds its final seated position by a distance sufficient to allow the other of said tubes to be placed in position aligned with said second end.

4,919,562

TORQUE TRANSMITTING MEMBER

William M. Anthony, Scottsdale, and Hans R. Ringger, Mesa, both of Ariz., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Division of Ser. No. 74,755, Jul. 17, 1987, Pat. No. 4,828,422.
This application Nov. 17, 1988, Ser. No. 272,612
Int. Cl.[5] B25G *3/00*
U.S. Cl. 403—16 7 Claims



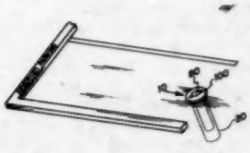
1. Apparatus comprising an elongate, tubular insert member, said insert member defining on an outer surface thereof an axially extending male spline shape, and on an inner surface thereof also defining an axially extending female spline shape, at one end thereof said insert member defining a plurality of circumferentially spaced apart axially extending portions, said axially extending portions cooperatively defining a plurality of circumferentially spaced apart, equiangularly extending crenels, and a annular washer star member, said star member defining a plurality of circumferentially spaced apart, radially outwardly extending, and equiangularly extending arm portions, said star member being received in said insert member such that said arm portions are received in said crenels and positioned between said axially extending portions, said arm portions and said insert member cooperatively defining opposed, contacting thrust surfaces for transferring axially directed force from said star member to said insert member.

4,919,563

VEHICLE PARKING OR PASSAGEWAY SECURITY BARRIER

David L. Stice, 4625 Applewood, Odessa, Tex. 79761

Filed Aug. 14, 1989, Ser. No. 393,127
Int. Cl.[5] E01F *13/00*
U.S. Cl. 404—6 12 Claims



3. A vehicular barrier system for restricting movement in a vehicle way, placed below the surface of such vehicle way including a bollard selectively protuberant above the surface of such vehicle way comprising:

a casing implanted below such vehicle way;

an electromechanical drive mechanism including a reversible motor retained as a unit within said casing and coupled to the bollard for erecting or retracting the bollard to or from a protuberant position obstructing movement in such vehicle way;

a bezel surrounding the bollard and releasably secured to said casing for restricting access to the electromechanical drive mechanism;

a locking assembly means integral with the bollard permitting limited rotation for access to the bollard for replacement, adjustment or repair;

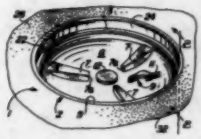
an electronic control means associated with the motor of the electromechanical drive mechanism for activating the motor to operate the electromechanical drive mechanism for erecting or retracting the bollard.

4,919,564

MANHOLE INSERT

David L. Neathery, Shreveport, and Harold E. Owen, II, Keithville, both of La., assignors to David L. Neathery, Shreveport, La.

Filed Dec. 15, 1988, Ser. No. 284,620
Int. Cl.[5] E02D *29/14*
U.S. Cl. 404—25 41 Claims



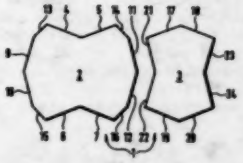
1. A manhole insert for location in a manhole beneath a manhole cover, said manhole insert comprising a dish-shaped body having a curved bottom terminated by an upward-standing side wall; at least one bottom rib provided in said bottom for strengthening said bottom; a pressure relief valve provided in said bottom for releasing pressure in the manhole; and a rim shaped in the top edge of said side wall for supporting said manhole insert in the manhole.

4,919,565

COMPOSITE STONE SET

Reinhard Göpfert, Hannoversche Str. 156, D-3070 Nienburg, Fed. Rep. of Germany

Filed Oct. 21, 1988, Ser. No. 267,312
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1987, 3735865
Int. Cl.[5] E01C *5/06*
U.S. Cl. 404—41 3 Claims



1. A set of stones for the production of an interlocking stone formation for the surface reinforcement of roads, public squares, walks and the like from a dodecagonal stone and an octagonal stone which engages the same, characterized in that four oppositely disposed sides (4, 5, 6, 7 and 21, 22, 23, 24) on each of the dodecagonal stone (2) and the octagonal stone (3) define two corners pointing towards the center of the stone.

4,919,566

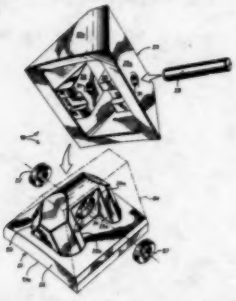
FILL AND COMPACTION ROLLER USING READILY REPLACEABLE CLEAT ASSEMBLIES

James O. Caron; Kenneth H. Pratt, both of Modesto, and Richard D. Genger, Alameda, all of Calif., assignors to Caron Compactor Co., Modesto, Calif.

Continuation of Ser. No. 215,758, Sep. 19, 1988, abandoned, which is a continuation-in-part of Ser. No. 19,791, Feb. 27, 1987, abandoned, which is a continuation-in-part of Ser. No. 798,464, Nov. 15, 1985, abandoned, which is a continuation-in-part of Ser. No. 639,848, Aug. 13, 1984, abandoned. This application Sep. 1, 1989, Ser. No. 403,904

Int. Cl.[5] E01C *19/26*

U.S. Cl. 404—121 **23 Claims**



1. A fill and compaction roller of a type having a rigid cylindrical body supported for rotation from a vehicle chassis and having cleat assemblies carried by the body, the cleat assemblies each comprising a rigid mounting pad assembly having a base portion welded to said body and a bracket integral to said base portion protruding generally radially outwardly therefrom, a coupling opening extending transversely through said bracket, a detachable cap unit readily releasably coupled to said base portion, said cap unit having a generally hollow body including sloping upwardly converging outer side walls extending radially outwardly sufficiently in a given direction to substantially meet and define a longitudinal blade therebetween, and transverse end walls extending between the end edges of said side walls, a length of coiled spring wire disposed within and along the axial length of said coupling opening, said coiled spring wire having a central opening axially thereof, said wire being coiled to lie within an imaginary cylindrical configuration, both ends of said wire lying within said imaginary cylinder to permit said spring to be easily slidably inserted into said coupling opening in closely spaced relation therearound, a pair of aligned openings respectively formed through the side walls and aligned with said coupling opening and said central opening of said coiled spring wire for receiving a coupling pin therethrough, a coupling pin disposed through said coupling opening, said coiled spring wire, and said aligned openings to cause said length of coiled spring wire to engage said pin in a manner to retain said cap unit to said mounting pad assembly, said coiled spring wire readily releasably locking said pin in said openings to prevent decoupling of said cap unit from said pad assembly, while permitting the spring to elongate when said pin is struck by a hammer, such elongation serving to break up caked soil thereon otherwise inhibiting removal of said cap unit.

4,919,567

SUBSURFACE DUNE RESTORATION SYSTEM AND METHOD

Jay W. Sample, 2119 Longview Dr., Tallahassee, Fla. 32303

Filed Jun. 1, 1989, Ser. No. 359,795

Int. Cl.[5] E02B *3/12*

U.S. Cl. 405—19 **14 Claims**

1. A subsurface dune restoration system comprising an underlay of filter cloth positioned upon a prepared dune surface having a predetermined slope, a least one sand-filled geotextile container arranged in a row forming a course along the dune generally parallel to the shoreline, a plurality of courses of said sand-filled containers placed upon the dune surface, each of said courses being elevated a predetermined distance relative to an adjacent seaward course as they progress landward up said sloped dune surface forming a soft revetment presenting a specific wave impact surface, said containers being formed of a material having specific flexibility and permeability characteristics, and filling means extending the length of each container, said filling means operable from either end of said container facilitating filling of the containers in their assembled position, wherein said courses terminate in gentle relatively wide sweeping curves preventing turbulent rotor currents and consequent aggravated erosion at the ends of said dune restoration system, said containers normally being covered with a layer of sand whereby a relatively soft subsurface dune restoration system effective to deplete wave energy is formed.

4,919,568

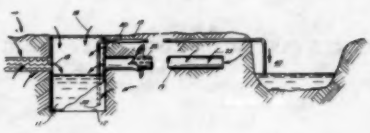
SYSTEM FOR DRAINING LAND AREAS THROUGH SIPHONING FROM A PERMEABLE CATCH BASIN

Dennis Hurley, P.O. Box 702, Marrero, La. 70073

Filed Apr. 27, 1988, Ser. No. 187,022

Int. Cl.[5] C02F *9/00*

U.S. Cl. 405—43 **18 Claims**



1. A method of establishing a continuous siphon in the draining of land areas the system comprising:

(a) providing a water collection basin having fluid permeable walls and a top portion, the basin positioned in the ground to a level of the top portion, for receiving aboveground or underground water flow into the basin, and blocking the flow of solid material into the basin;

(b) providing means for receiving the water collected in the basin at an exit point distant from the basin;

(c) providing a fluid flow line between the water collection basin and the exit point;

(d) establishing an uninterrupted siphon of water through the flow line between the collection basin and the receiving means; and

(e) positioning the collection basin at a level in the ground so that the lowest point of water that can be collected through siphon from the basin is below the lowest most point of water in the receiving means.

4,919,569

PROCESS FOR DISPOSING OF WASTE

Siegfried Wittenzellner, 24 Florgate Road, Farmingdale, N.Y. 11735

Filed Nov. 10, 1988, Ser. No. 269,575

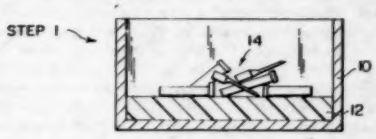
Int. Cl.[5] E02D *3/12*

U.S. Cl. 405—128 **7 Claims**

1. A process for disposal of medical waste comprising the steps of:

(a) providing a container, partially filling said container with a fluid, hardenable water insoluble epoxy resin which is noncohesive with said container and disposing medical waste in the fluid, hardenable resin disposed in said container;

(b) substantially filling said container with additional fluid,



hardenable epoxy resin to combine with the initial resin and encasing said medical waste therein;

(c) hardening said resin until said resin comprises a rigid non-soluble block;

(d) removing the hardened epoxy resin block from said container having said medical waste encased therein; and

(e) thereafter dumping or using said block.

4,919,570

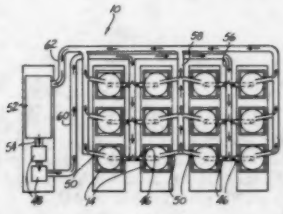
PORTABLE ON SITE SOIL TREATMENT SYSTEM

Frederick C. Payne, Charlotte, Mich., assignor to Midwest Water Resource, Inc., Charlotte, Mich.

Filed Nov. 28, 1988, Ser. No. 276,650

Int. Cl.[5] B01D *13/00*

U.S. Cl. 405—128 **9 Claims**



1. Apparatus for treating contaminated earth, said apparatus comprising containment means for holding said contaminated earth during treatment, said containment means comprising one or more treatment vessels, each treatment vessel containing a quantity of contaminated fluid permeable earth and having an inlet port and an outlet port, means for sealing each treatment vessel against leakage of said earth, a first conduit connecting each treatment vessel inlet port in flow communication with a pumping station which pumps fluid through each treatment vessel, a second conduit connected in flow communication between each treatment vessel outlet port and a fluid treatment station, and a third conduit connecting said pumping station in flow communication with said fluid treatment station wherein said fluid is recirculated through said conduits and through said treatment vessels to provide for continuous treatment of said contaminated earth while in said treatment vessels.

4,919,571

ORIENTATABLE BLOCKING UNIT WITH CARDAN JOINT FOR SUPPORTING STRUCTURES ON CYLINDRICAL ELEMENTS

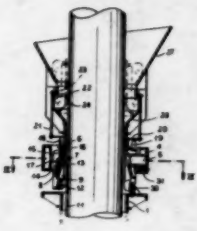
Oneglio Sala, and Paolo Montanari, both of Bologna, Italy, assignors to Riva Calzoni S.P.A., Milan, Italy

Filed Sep. 29, 1988, Ser. No. 252,070

Claims priority, application Italy, Oct. 5, 1987, 22145 A/87

Int. Cl.[5] E02B *17/08*

U.S. Cl. 405—199 **9 Claims**



1. An orientatable blocking unit for securing a structure on a cylindrical post, comprising:

a lower annular body surrounding said post with play and carrying said structure;

an intermediate annular body surrounding said post with all-around clearance;

an upper annular body surrounding said post with play and having a portion interposed between said post and said intermediate body;

a first pair of axially aligned pins articulatingly connecting said lower annular body to said intermediate annular body;

a second pair of axially aligned pins extending perpendicular to but coplanar with said first pair of pins articulatingly connecting said upper annular body at said portion to said intermediate annular body;

means on said portion of said upper annular body defining a plurality of upwardly converging slide seats angularly equispaced around said post and having respective cone generatrices;

respective upwardly tapering wedge-shaped jaws having inwardly turned frictional surfaces confronting said post and frictionally engageable therewith upon an upward movement of said jaws relative to the respective seats, said jaws being slidable on the respective seats along said generatrices;

respective elastic means bearing upon said jaws and urging same upwardly along the respective seats from a lower unblocking position into an upper blocking position in which said jaws fix said unit to said post;

detent means engageable with said jaws for releasably retaining same in said lower positions; and elastic connection means interposed between said lower annular body and said upper annular body and between said intermediate annular body and said upper annular body for yieldably urging said body into axial alignment and enabling angular orientation of said upper body relative to said lower body.

4,919,572

FENDER PILE

Jurgen Bergfelder, Cologne, Fed. Rep. of Germany, assignor to Strabag Bau-AG, Koln-Deutz, Fed. Rep. of Germany

Filed Sep. 12, 1988, Ser. No. 243,408

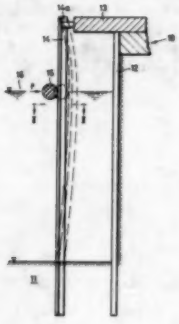
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1987, 3731262

Int. Cl.[5] E02B *3/22*

U.S. Cl. 405—212 **4 Claims**

1. A prestressed concrete fender pile comprising: an elon-

gated concrete pile member having a T-shaped cross section including a flange and a web; prestressing members comprising a plurality of embedded, elongated, prestressed glass fiber composite elements extending longitudinally within said pile



member, said member including a first set of said elements arranged within said flange and prestressed to a degree closely approaching their elastic tensile limit, and a second set arranged within said web and prestressed substantially less than said degree of prestressing of said first set.

4,919,573

BALL END MILL

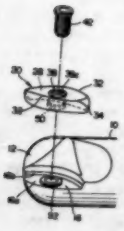
Osamu Tsujimura, Kawasaki; Tatsuo Arai, Kitamoto, and Masayuki Okawa, Kawasaki, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 20, 1988, Ser. No. 246,639

Claims priority, application Japan, Sep. 22, 1987, 62-237943; Nov. 30, 1987, 62-182165; Mar. 1, 1988, 63-27300

Int. Cl.[5] B23C *5/10, 5/14*

U.S. Cl. 407—40 **7 Claims**



1. A ball end mill comprising:

an end mill body including an axis of rotation therethrough and an insert receiving recess formed in a forward end portion thereof and having a bottom face;

an indexable cutter insert having a front face, a rear face and at least two convexly curved side faces lying between said front and rear faces, said insert having at least two convexly curved main cutting edges each defined by the intersection of a respective one of said convexly curved side faces with said front face, said insert being received in said insert receiving recess with said rear face mated with said bottom face of said recess in such a manner that one of said main cutting edges is indexed in a cutting position, said front face serving as a rake surface for said indexed main cutting edges;

clamp means for releasably securing said cutter insert to said insert receiving recess; and

shift preventing means for preventing said cutter insert from being shifted during a cutting operation of the ball end mill, said shift preventing means comprising a surface defining a shouldered engaging recess formed in one of the bottom face of said insert receiving recess and the rear face of said insert and an engaging projection complementary to said engaging recess and provided on the other of the bottom face of said insert receiving recess and the rear face of said insert so as to be brought into engagement with said shouldered engaging recess with said surface of said shouldered engaging recess being in circumferential surrounding relationship with said engaging projection said bottom face of said insert receiving recess facing generally in the direction of rotation of said body, said insert receiving recess having a generally arcuate side wall facing axially forwardly and radially outwardly of said end mill body, said insert being of a generally ellipsoidal shape having a pair of said convexly curved side faces, one of said side faces cooperating with said front face to define the other main cutting edge, said other main cutting edge being held in abutment with said side wall, said cutter insert having a centrally located aperture therethrough with said shouldered engaging recess surrounding said aperture in said cutter insert so as to be coaxial therewith, said clamp means comprising a screw and said insert receiving recess having a threaded bore receiving said screw when said screw is passed through said aperture in said cutter insert.

4,919,574

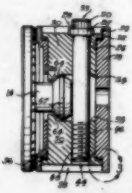
TOOL HOLDER RETENTION SYSTEM

Russell H. Samyn, Rolling Meadows, Ill., assignor to Illinois Tool Works Inc., Glenview, Ill.

Filed Mar. 31, 1989, Ser. No. 331,196

Int. Cl.[5] B23B *31/02*

U.S. Cl. 409—219 **16 Claims**



1. A holder retention mechanism for a tool holder or workpiece holder which creates a holder clamping force and a self-centering meshing force, said holder including a holder retention portion operatively retainable by said retention mechanism and a coupling portion attached to said holder retention portion for engaging a surface of said holder retention mechanism when said holder is in one of a plurality of rotary positions, said holder retention mechanism comprising: clamping means for retainably engaging said holder retention portion; a mechanism housing positioned about an axis and being formed with a first bore and a second bore, said first bore and said second bore forming a cavity at an intersection of said bores, said first bore being dimensioned and shaped for receiving said clamping means and said second bore being dimensioned and shaped for receiving said holder retention portion, a holder coupling surface formed on said mechanism housing extending radially with respect to said axis, spiral surface means formed on said holder coupling surface in an annular path, said annular path being generally concentric with said axis, said spiral surface means being formed for cooperatively engaging complementary surface means on said coupling portion of said holder; a clamping means engaging member operatively coupled with said clamping means for creating a clamping force in said clamping means when said holder retention

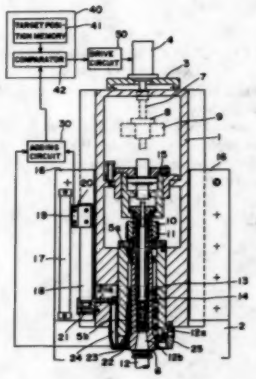
portion is inserted into said second bore and said clamping means engaging member is actuated, whereupon said spiral surface means cooperatively engage said coupling portion of said holder for retaining and centering said holder in said holder retention mechanism.

4,919,575

APPARATUS FOR COMPENSATING FOR THE THERMAL DISPLACEMENT OF THE MAIN SPINDLE OF A MACHINE TOOL

Takasi Yoshimi, Gamagori; Akihiro Matsuura, Chiryu; Toshiharu Takashima, Kariya, and Hiroyuki Nakano, Tokai, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed May 16, 1989, Ser. No. 352,470
Claims priority, application Japan, May 20, 1988, 63-123567; May 20, 1988, 63-123568
Int. Cl.[5] B23C *1/06*; B23B *39/08*; G05B *19/18*
U.S. Cl. 409—231 10 Claims



1. A compensating apparatus capable of compensating for the thermal displacement of a main spindle supported on a spindle head which is movably guided on a frame of a machine tool, and is moved by a servomotor, wherein said compensating apparatus comprises:

a feed back scale and a measuring head disposed between said frame and the front end portion of said spindle head, said measuring head electrically engaging with said feed back scale and outputting a signal which indicates the present position of said front end portion of said spindle head;

thermal displacement measuring means attached to said front end portion of said spindle head for detecting the thermal displacement of the front end portion of said main spindle with respect to said spindle head;

numerical control means for comparing the present position of said front end portion of the spindle head detected by said measuring head with a command target position, and for driving said servomotor in accordance with the difference between the present position of the front end portion of said spindle head and said target position so that the front end portion of said spindle head is moved to a final position corresponding to said commanded target position; and

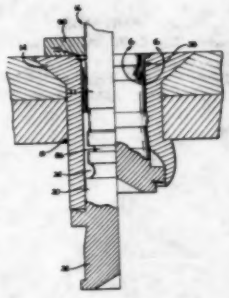
compensating means for shifting said final position depending upon the thermal displacement of said main spindle so as to move the front end portion of said main spindle to said commanded target position.

4,919,576

LOCKING APPARATUS FOR BLIND FASTENERS

John A. Louw, Temecula; William H. Owens, Fontana, and Ralph Luhm, La Habra, all of Calif., assignors to Allfast Fastening Systems, Inc., Industry, Calif.

Continuation-in-part of Ser. No. 56,067, Jun. 1, 1987, abandoned, which is a continuation of Ser. No. 766,039, Aug. 16, 1985, abandoned, which is a continuation-in-part of Ser. No. 646,766, Sep. 4, 1984, abandoned. This application Jan. 26, 1988, Ser. No. 148,678
Int. Cl.[5] F16B *13/04*
U.S. Cl. 411—34 28 Claims



17. In a blind rivet assembly having:

a tubular rivet sleeve having a cylindrical opening therethrough, and an expandable sleeve tail on the other end thereof,

a stem extending through said sleeve and said head,

a tail former at the tail end of the stem adjacent said sleeve tail for expanding said tail,

a pulling portion on a pulling end of the stem adapted to be engaged by a tool for pulling the stem,

a plug portion of the stem adjacent said tail former,

a locking groove in the stem adjacent said plug portion,

the portion of the stem between said locking groove and said pulling portion being of smaller diameter than the interior diameter of said sleeve and head,

the improvement comprising

a locking collar positioned over said stem and within the cylindrical opening of said tubular rivet sleeve between said plug portion and said pulling portion, said locking collar having a body portion defining an inner diameter to slide over the portion of said stem between said locking groove and said pulling portion, and an outer diameter to slide within said interior diameter of said sleeve, said body portion having a first locking collar portion and a second locking collar portion, said first locking collar portion having an outer diameter slidable within said cylindrical opening in said tubular rivet sleeve and being slidable along said stem to abut said plug portion of said stem, said second locking collar portion having an outer diameter also slideable within said cylindrical opening in said tubular rivet sleeve and an inner diameter slideable along said stem, the region of said first locking collar portion adjacent said second locking collar portion and the region of said second locking collar portion adjacent said first locking collar portion being cooperatively shaped to deform, relative to said first locking collar portion, the region of said second locking collar portion adjacent said first locking collar portion tightly into said locking groove during pulling when said first locking collar portion is restricted to movement with said stem by engagement with said plug portion,

wherein said preformed head of said rivet sleeve has an annular recess in the face thereof a diameter larger than the inner diameter of said tubular rivet sleeve and deeper

than the radial thickness of said locking collar, and wherein the end of said second locking collar portion opposite said first locking collar portion has an internal relief whereby forceful engagement of the end of said locking collar portion having said internal relief with a surface substantially prependicular with the axis of said blind rivet assembly will cause, as pulling progresses, said second locking collar portion to partially flare outward in the region of said relief, and to thereafter yield in compression to substantially fill said annular recess in said performed head.

4,919,577

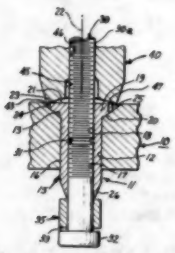
BLIND FASTENER

Lloyd S. Binns, Harbor City, Calif., assignor to Hi-Shear Corporation, Torrance, Calif.

Filed Feb. 13, 1989, Ser. No. 310,298

Int. Cl.[5] F16B *13/04, 13/06*

U.S. Cl. 411—43 **15 Claims**



1. In a blind fastener of the type having a central axis and an axially extending sleeve with an axially extending internally threaded passage therethrough, a head at one end having an axially facing surface thereon with a periphery which is centered on said axis; a mandrel including an axially extending threaded shank threaded into and through said passage, a torque-off groove on said shank, and torque tool engaging means accessible at the head end of said sleeve, and blind upsetting means axially movable by rotating said mandrel to form an enlarged body at the unheaded end of said sleeve; and a nut threaded to said mandrel with a bearing face facing toward said surface of the head of said sleeve, the improvement comprising:

said bearing face of said nut being concavely shaped so as to make contact with and thereby a retention engagement with at least some points around said periphery to hold the sleeve against rotation relative to the nut when the mandrel is drawn into the sleeve with the nut pressed against said head.

4,919,578

RIVETLESS NUT PLATE AND FASTENER

Henry J. Zeigler, Orlando, and Bruce L. Frisinger, Windermere, both of Fla., assignors to Martin Marietta, Bethesda, Md.

Filed Jun. 9, 1988, Ser. No. 204,285

Int. Cl.[5] F16B *37/04, 39/28*

U.S. Cl. 411—113 **9 Claims**

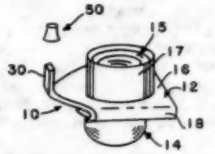
1. A nut plate for use with a threaded fastener, the nut plate comprising:

a generally flat portion having a passageway therethrough;

means for securing said nut plate to a mounting plate, said means for securing including a tubular portion which is integral with said generally flat portion and which extends generally perpendicularly to said flat portion;

means for floatingly securing a threaded fastener to said nut plate adjacent said passageway whereby a threaded member may be received by said threaded fastener; and

means for preventing relative rotation between said nut plate and said mounting plate, said means for preventing relative rotation including a projection which extends generally perpendicularly from said flat portion, said projection being provided on the same side of said flat portion as the tubular portion of said means for securing.



4,919,579

ANCHOR CONSTRUCTION AND METHOD OF MANUFACTURE

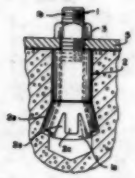
Masaaki Miyanaga, Hyogo, Japan, assignor to Kabushiki Kaisha Miyanaga, Hyogo, Japan

Continuation-in-part of Ser. No. 204,224, Jun. 9, 1988, Pat. No. 4,865,246. This application Aug. 22, 1988, Ser. No. 234,420

Claims priority, application Japan, Aug. 24, 1987, 62-128454[U]; Dec. 18, 1987, 62-321735

Int. Cl.[5] F16B *13/06*

U.S. Cl. 411—55 **17 Claims**



1. An anchor bolt comprising a bolt including a lower conical head, said conical head including an outer peripheral wall having a radius of curvature which gradually increases from one end to the other end thereof, and a sleeve for surrounding said bolt, said sleeve comprising an annular expander, said expander having multiple slits therein which open to the bottom end and extend substantially axially, said slits forming expansion pieces therebetween having radius of curvatures which, before expansion of said pieces, are substantially the same as the radius of curvature at the corresponding positions of said outer peripheral wall of said conical head, which said pieces contact after expansion and the outer surfaces of said expansion pieces forming a conical shape after expansion of said pieces.

4,919,580

RECEPTACLE FOR QUICK-RELEASE FASTENER

Andrew C. W. Wright, 4a Green Lane, Farnham, Surrey, England

Filed May 31, 1989, Ser. No. 359,163

Claims priority, application United Kingdom, Jun. 17, 1988, 8814488

Int. Cl.[5] F16B *37/02*

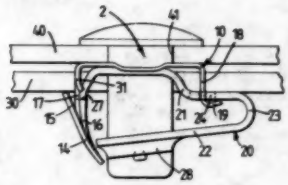
U.S. Cl. 411—173 **6 Claims**

1. A two-part front mounted receptacle for a quick-release fastener including a stud, said receptacle being mountable in a

support provided with an aperture and having a front and a back;

said receptacle having a body part having a first, substantially planar, front element, said front element having first and second ends and being formed with an aperture therethrough, said body part having a leg element depending from each of said ends of said front element, a first one of said leg elements having at least one sprung barb for engaging a rear face of said aperture in said support; and,

a substantially U-shaped spring retainer having first and



second sides, each of which has first and second ends, said first side being arranged to be engaged and held to each of said leg elements of said body part and projecting beyond an end of said body part remote from said first leg element, said second side having a retention mechanism for engaging and retaining in use said stud connected therewith, said second side being spaced on an opposite side of said first side from said front element of said body part, and said first side having an aperture aligned with said aperture in said body part and said retention mechanism to allow said stud to pass therethrough.

4,919,581

LOSS-PROOF FASTENER AND CONSTITUENT PART

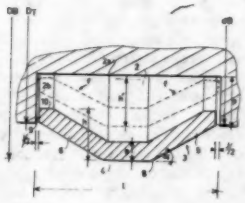
Gérard Dubech, Toulouse, France, assignor to MECAERO, S.A., Muret, France

Continuation of Ser. No. 724,247, Apr. 17, 1985, abandoned. This application Jul. 28, 1986, Ser. No. 889,837

Claims priority, application France, Apr. 25, 1984, 84 06904

Int. Cl.[5] F16B *21/18*

U.S. Cl. 411—353 **15 Claims**



1. A loss-proof fastener of the type capable of repeated insertion through and withdrawal from a passageway formed in a workpiece without significant damage to the fastener and comprising a fastener member including a shank portion having an annular groove (2) and a ring (3) in said groove and transversely split (7) so as to provide an elastic deformation in the direction of the circumference, said ring having a cross-section such that said ring is elastically deformable so as to be capable of transverse elongation and radial contraction when said ring is subjected to a radial compressive force, and said ring having lateral edges lying within said groove around the circumference of said ring both in a rest condition and in a compressed condition and a portion between said radial edges extending radially beyond said shank portion in said rest condition whereby in a rest condition said portion of said ring projects beyond the shank portion surface and in a compressed condition is retracted within said groove, and said ring when positioned in said groove having a lateral play to permit the cross-section thereof to freely deform when compressed between the rest and the compressed conditions.

4,919,582

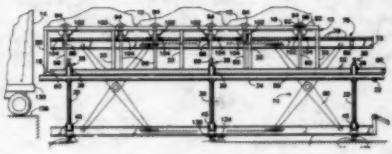
METHOD AND APPARATUS FOR LOADING AUTOMOBILES INTO A CARGO CONTAINER

H. John Bates, Yorba Linda; Kermit L. Achterman, La Canada, both of Calif.; Peter Gearin, Portland, and Terence Halpin, West Linn, both of Oreg., assignors to Greenbrier Intermodal, Inc., Lake Oswego, Oreg.

Filed Apr. 14, 1988, Ser. No. 181,684

Int. Cl.[5] B60P *1/64*; B65G *67/02*

U.S. Cl. 414—233 **40 Claims**



1. An apparatus for loading or unloading a lightweight sleeve which is capable of carrying a plurality of automobiles and being placed into an enclosed container, said apparatus comprising:

(a) means for supporting a sleeve;

(b) means, independent of said means for supporting a sleeve, for supporting a plurality of automobiles;

(c) means for imparting relative movement to said sleeve supporting means and said automobile supporting means such that said automobiles are inserted into or removed from said sleeve from the bottom thereof;

(d) means for attaching the automobiles to said sleeve so that after automobiles have been inserted into said sleeve said automobile supporting means can be separated from said sleeve supporting means;

(e) means for moving the sleeve onto and off of said sleeve supporting means so that said sleeve and said automobiles can be placed into or removed from a container as a unit; and

(f) wherein both said sleeve supporting means and said automobile supporting means are movable.

4,919,583

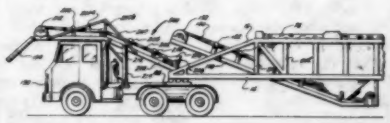
TRAILER

William J. Speakman, Jr., 6525 Millstone Ave., Baton Rouge, La. 70808

Filed Oct. 3, 1988, Ser. No. 252,108

Int. Cl.[5] B60P *1/36*; E01C *19/20*

U.S. Cl. 414—528 **6 Claims**



1. A towing vehicle and an attached trailer for dumping a

loose, solid material while said towing vehicle and said attached trailer are in a forward motion, said trailer comprising:

(a) an elongated frame having (i), adjacent one of its ends, attaching means for attaching said frame to said towing vehicle, and (ii), adjacent the other of its ends, at least one axle and wheel set;

(b) a bin carried by said frame, said bin having side walls which downwardly converge towards one another at their lower extent, and a bottom wall connected to said side walls at their lower edges, said bin being dimensioned to have a depth sufficient to hold the desired amount of solid material;

(c) a discharge means associated with said bin to effect discharge of said solid material from said bin when desired; and

(d) conveying means to convey said solid material, as it is discharged from said bin, along a path which is substantially in the vertical plane of the long axis of said trailer and which extends from the discharge means, over at least a portion of said towing vehicle, to a dumping point whereby said dumping point is in front of said towing vehicle when said towing vehicle and trailer are being driven forward and when the vertical planes of the long axis of said towing vehicle and said trailer are in substantial alignment

(e) wherein said trailer is a semitrailer and said attaching means is a fifth wheel.

4,919,584

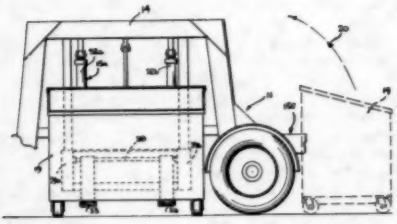
TRASH BIN VEHICLE TRANSPORTER

Roland D. Bouchard, Box 7069, Hemet, Calif. 92343

Filed Jul. 22, 1988, Ser. No. 222,892

Int. Cl.[5] B65G 67/02

U.S. Cl. 414—540 **3 Claims**



1. A bin transporter system for use in lifting a plurality of bins onto a vehicle for transportation and subsequent unloading from said vehicle comprising:

a main frame mounted on said vehicle,

a plurality of lift systems mounted on said frame,

each of said lift systems comprising:

a cross bar,

lift arm means mounted on said cross bar,

a pair of support bars mounted on said main frame in spaced apart relationship,

a support frame slidably supported on each of said support bars,

a bracket connected between said support frames, said cross bar being supported between said support frames,

drive means for driving said support frames slidably along said support bars to lift said lift arm means upwardly to a predetermined raised position and to lower said lift arm means downwardly to a predetermined lowered position,

means for mechanically latching said bracket to retain the lift arm means in the predetermined raised position comprising a latching arm pivotally supported on said main frame, said latching arm having an elongated notch formed therein, the bracket being retained in said notch when the lift arm means is in the raised position, said latching arm further having a cam surface, and spring means for urging said latching arm against said bracket, and

means for withdrawing said latching arm from engagement with said notch comprising a handle and means for coupling said handle to the latching arm,

whereby as the lift arm means approaches the predetermined raised position, the bracket rides along the latching arm cam surface and is finally driven into latching engagement with said notch by said spring means and when said handle is actuated, the latching arm is withdrawn from said bracket against the action of said spring means to unlatch the bracket.

4,919,585

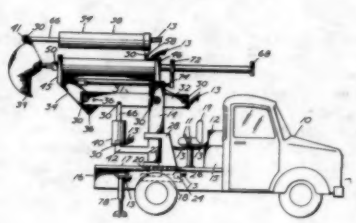
VEHICULAR MOUNTED EXCAVATOR

Peter L. Ruiz, 2233 Wyandotte Ave., Oroville, Calif. 95966

Filed Sep. 5, 1989, Ser. No. 402,753

Int. Cl.[5] B66C 3/00

U.S. Cl. 414—718 **7 Claims**



1. A vehicular mounted excavator adapted for both horizontal trenching and vertical shaft digging, comprising;

an elongated boom support attached to said vehicle, said boom support adapted to be rotated by hydraulically powered means, said boom support further adapted to be used in a generally vertical position;

a boom having a first and second end, said boom pivotally attached at said first end to an upper end of said boom support;

hydraulically powered means adapted for raising and lowering said second end of said boom relative to said first end of said boom;

a digging arm structured of an elongated main tubular housing, a first longitudinal slot through said main tubular housing, a second longitudinal slot through said main tubular housing and oppositely disposed from said first slot, a first and second slidable member each slidably housed within said main tubular housing, said boom at said second end thereof extending through said second slot and attaching to said second slidable member, a pivot point in said second end of said boom adjacent said second slidable member, means for locking said pivot point temporarily rigid, a digging arm tilting hydraulic ram attached at a first end thereof to said first end of said boom, said digging arm tilting hydraulic ram attached at a second end thereof to said digging arm, said digging arm tilting hydraulic ram adapted to allow altering angles between said boom and said digging arm, one end of said first slidable member extending beyond a bottom end of said main tubular housing pivotally attaching generally centrally to a digging bucket member adapted to scoop earth, a bucket repositioning hydraulic ram having a first and second end with said first end pivotally attached to a rearward end of said digging bucket member, said second end of said bucket repositioning hydraulic ram attached by pivotal attachment means to one end of a connecting arm, an opposite end of said connecting arm extending through said first slot in said main tubular housing and attaching to said first slidable member, said bucket repositioning hydraulic ram

adapted to cause pivoting of said digging bucket member, a first slidable member repositioning hydraulic ram attached to said first slidable member adapted to raise and lower said first slidable member relative to said main tubular housing, a second slidable member repositioning hydraulic ram adapted to raise and lower said main tubular housing relative to said second slidable member with attached boom relative;

powering means for said hydraulic rams and said hydraulically powered means of said boom and said boom support;

controls adapted to be manually activated to actuate said hydraulic rams and said hydraulically powered means of said boom and said boom support;

said digging arm adapted for vertical positioning providing for digging generally straight side walled vertical shafts, said boom attached to said second slidable member of said digging arm adapted for placement at an upper end of said digging arm when said digging arm is in said vertical position allowing digging said vertical shafts to a maximum depth;

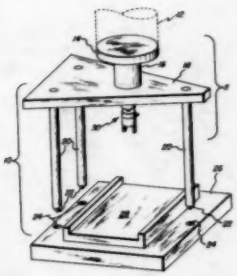
said digging arm adapted for angled positioning providing for digging said horizontal trenches.

4,919,586

MECHANICAL CLOSED LOOP ROBOTIC ARM END EFFECTOR POSITIONING SYSTEM

Stephen J. Derby, Brunswick, N.Y., assignor to Grasp, Inc., Troy, N.Y.

Filed May 25, 1988, Ser. No. 198,478
Int. Cl.[5] B66C 1/00
U.S. Cl. 414—735 **23 Claims**



1. A mechanical closed loop system for translationally locating along X, Y, Z axes and rotationally locating about each of said X, Y, Z axes the distal end of a robotic arm relative to a workpiece fixture, the distal robotic arm end having an independently operated micro-robotic manipulator affixed thereto for performance of high precision tasks on a workpiece positioned on said fixture, said system comprising:

a wrist assembly mountable to the robotic arm, said assembly having a compliant member and a first positioning member connected to the compliant member, said first positioning member including a first docking means;

a second positioning member associated with the workpiece fixture, said second positioning member including a second docking means;

said first docking means and said second docking means comprising:

(i) a first positioning leg connected to one of said first positioning member and said second positioning member and a first positioning port associated with the other of said first positioning member and said second positioning member, said first positioning port having a tapered lead in configured to engagably receive and position said first positioning legs free end as the robotic arm attains a target position relative to the workpiece fixture;

(ii) a second positioning leg connected to one of said first positioning member and said second positioning member and a second positioning port associated the other of said first positioning member and said second positioning member, said second positioning port having a tapered lead in configured to engagably receive and position said second positioning leg's free end as the robotic arm attains its target position relative to the workpiece fixture;

(iii) a third positioning leg connected to one of said first positioning member and said second positioning member, said third positioning leg being sized and configured such that its free end engages the other of said first positioning member and said second positioning member when the robotic arm attains its target position relative to the workpiece fixture;

said compliant member providing rotational and translational freedom of movement for said first docking means to precisely position itself with respect to and interlock with said second docking means to ensure that the robotic arm attains the desired three-dimensional coordinates and three-dimensional rotational orientation relative to the workpiece fixture; and

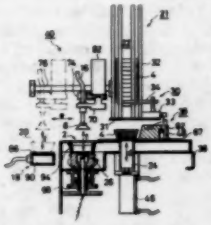
said micro-robotic manipulator being located intermediate said first positioning member and said second positioning member when said first docking means and said second docking means are interlocked, whereby docking of said first and second positioning members produces a translational and rotational six-degree of freedom mechanical closed loop reference frame which separates operation of the independent micro-robotic manipulator from gross movement inaccuracies and vibrations of the robotic arm.

4,919,587

APPARATUS FOR SEPARATING AND TRANSFERRING SOFT CUPS

Yasunori Tashiro, and Yuji Suzuki, both of Tochigi, Japan, assignors to Rheon Automatic Machinery Co., Ltd., Utsunomiya, Japan

Filed Nov. 4, 1988, Ser. No. 267,068
Claims priority, application Japan, Nov. 7, 1987, 62-281648
Int. Cl.[5] B65G 59/10
U.S. Cl. 414—795.8 **8 Claims**



1. An apparatus for separating a stack of cups, made of soft material such as paper or aluminum foil, from each other, and transferring them comprising:

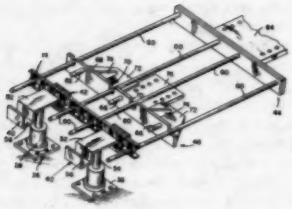
(a) a continuously rotating holder means on which a stack of said cups is placed, and

(b) a vertically and horizontally movable non-rotating suction means arranged to be lowered and pressed against the cup at the top of said stack on said rotating holder, suck a cup out of and separate said cup from said stack of cups and, after being raised, to be horizontally moved to transfer said cup to a preselected position.

4,919,588
SWEEP STACKER

Charles J. Brun, Xenia, Ohio, assignor to Kindex, Inc., Laura, Ohio

Filed Feb. 13, 1989, Ser. No. 309,178
Int. Cl.[5] B65G 57/16
U.S. Cl. 414—798.4 10 Claims



1. Apparatus for stacking a plurality of elements, each element formed to nest with other similar elements, the apparatus comprising:

a base, first track means fixed to the base, and suspending means movable along the first track means with respect to the base into engagement with a plurality of elements for suspending the elements in spaced relation to each other and above the base, the first track means defining the direction and limits of movement of the suspending means;

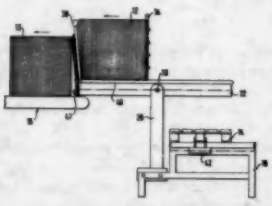
second track means fixed to the base, and sweeping means comprising at least one stub shaft movable along the second track means in a path parallel to said first track means from a first position adjacent to the elements through a second position engaging all the suspended elements for movement of the elements toward a third position free from the suspending means and into a nesting relation to each other, the second track means defining the direction and limits of movement of the sweeping means, and

abutment means fixed with respect to the base and providing a stop towards which the elements are swept by the sweeping means for accumulating the elements in an accumulated, stacked relationship.

4,919,589
APPARATUS FOR SUPPLYING A STACK OF CARTON BLANKS FORM A PALLET TO THE MAGAZINE OF A CARTON-PACKING MACHINE

Heinz Krappitz, Bredenhorn; Herbert Wölfel, Bayreuth, and Johannes Wolfrum, Himmelkron, all of Fed. Rep. of Germany, assignors to B.A.T. Cigarettenfabriken GmbH, Hamburg, Fed. Rep. of Germany

Filed Nov. 16, 1988, Ser. No. 271,683
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1987, 3739659
Int. Cl.[5] B65G 57/01; B65H 1/02
U.S. Cl. 414—798.9 12 Claims



1. An apparatus for supplying a stack of carton blanks from a pallet to the magazine of a carton-packing machine in which the carton blanks are arranged vertically adjacent to each other, in particular for the tobacco industry, comprising

an unloading carriage pivotable about a horizontal axis out of a substantially vertical position into a substantially horizontal position and having an unloading fork with prongs movable along the unloading carriage,

a base member which is reciprocatable by means of a chain drive parallel to a direction in which the pallet is conveyed and in the direction of the gaps between boards at the upper side of the pallet and which comprises vertical supports on which the unloading carriage is pivotally mounted,

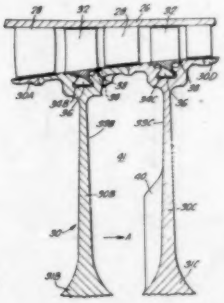
the prongs of said fork in the vertical position of the unloading carriage and thus in the horizontal position of the unloading fork being insertable beneath the stack into the gaps between boards at the upper side of the pallet,

a conveying means integrated into the unloading carriage for the transfer of the individual blanks from the unloading carriage to the magazine.

4,919,590
COMPRESSOR AND AIR BLEED ARRANGEMENT

Brian S. Stratford; Edward S. Hadaway; John Chew, and Howard G. Hartland, all of Derby, England, assignors to Rolls-Royce plc, London, England

Continuation of Ser. No. 201,740, Jun. 3, 1988, abandoned. This application Jul. 7, 1989, Ser. No. 376,149
Claims priority, application United Kingdom, Jul. 18, 1987, 8717015
Int. Cl.[5] F04D 31/00
U.S. Cl. 415—116 12 Claims



1. An axial flow compressor comprising a rotor and a casing, the rotor having a plurality of stages of circumferentially spaced radially outwardly extending rotor blades, the rotor comprising at least two axially adjacent rotor discs, the rotor discs being axially spaced and defining a chamber therebetween each rotor disc carrying one of the plurality of stages of rotor blades,

the casing surrounding and being spaced from the rotor and rotor blades,

air bleed means integral with the rotor arranged to bleed a portion of air from the compressor and supply the portion of air radially inwardly to said chamber,

said two axially adjacent rotor discs having opposed radially extending surfaces, at least one of the opposed radially extending surfaces being contoured, the contouring extending axially from the at least one of the opposed radially extending surfaces up to six times the width of a boundary layer formed on the at least one of the opposed radially extending surfaces, the contouring of the at least one of the opposed radially extending surfaces directing the bleed air radially inwardly to prevent the formation of a free vortex within said chamber and thereby reduce

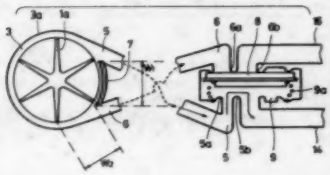
pressure losses in the bleed air flowing through the chamber.

4,919,591

WASHER PUMP FOR AUTOMOBILES

Takeshi Kamimura, Hamamatsu, and Toshihiro Satoh, Toyohashi, both of Japan, assignors to ASMO Co., Ltd., Kosai, Japan

Filed Jun. 2, 1989, Ser. No. 360,463
Claims priority, application Japan, Jun. 3, 1988, 63-73429[U]
Int. Cl.[5] F01D *1/30*
U.S. Cl. 415—152.1 **6 Claims**



1. A centrifugal washer pump for an automobile for supplying a cleaning fluid selectively to first and second washer nozzles of the automobile, comprising:

(a) an impeller having a plurality of radially extending vanes circumferentially spaced at equal intervals;

(b) a substantially circular centrifugal pump chamber receiving concentrically therein said impeller and having an inlet disposed in alignment with a central axis of said impeller for supplying the cleaning fluid to the center of said impeller, and first and second outlets defined in a sidewall of said centrifugal pump chamber and extending tangentially to said sidewall, said first and second outlets being subjected to different positive pressures when said impeller is rotating;

(c) a directional control valve including a valve chamber connected in fluid communication with said pump chamber through said first outlet and also through said second outlet, and a valve element movably disposed in said valve chamber for selectively connecting said first and second outlets, respectively, to the first and second washer nozzles; and

(d) a projection disposed between said first and second outlets and projecting inwardly from said sidewall of said centrifugal pump chamber toward said impeller for substantially blocking the flow of the cleaning fluid between said first and second outlets to thereby increase the pressure difference between said first and second outlets.

4,919,592

RADIALLY COMPACT FLUID COMPRESSOR

Stephan B. Sears, and Dan M. Pomeroy, both of Menlo Park, Calif., assignors to Superstill Technology, Inc., Redwood City, Calif.

Filed Jan. 18, 1989, Ser. No. 298,552
Int. Cl.[5] F04D *29/42*
U.S. Cl. 415—207 **1 Claim**

1. A centrifugal type of fluid compressor, comprising:

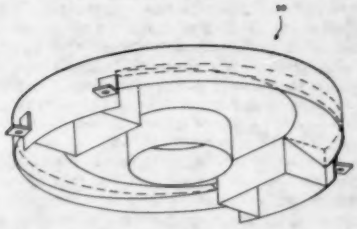
an impeller assembly including a horizontally extending impeller having an outermost edge defining an outermost horizontal, circumferential path of movement and means for rotating said impeller in a given direction so as to drive its outermost edge through said circumferential path, and

a compressor housing surrounding said impeller and together with the impeller defining a fluid collection chamber extending between a first upstream end and a second fluid exiting downstream end, said collection chamber progressively enlarging vertically from its upstream end to its downstream end, whereby fluid passing through said collection chamber from its upstream end to its downstream end progressively decreases in velocity and therefore progressively increases in static pressure,

wherein said collection chamber does not enlarge horizontally outward relative to said outermost horizontal path of movement of said impeller at any point between its entry and exit end, whereby to minimize the maximum horizontal dimensions of the overall compression housing,

wherein said collection chamber as it approaches its downstream exit end includes a section which extends vertically beyond said impeller,

wherein said section of said collection chamber extending vertically beyond said impeller includes a segment thereof extending horizontally inward of said impeller,



wherein said collection chamber defines a downwardly and inwardly spiralling path from its upstream end to its downstream exit end,

wherein said upstream and downstream ends of said collection chamber are spaced about 180 degrees from one another about said outmost circumferential path of said impeller, wherein said collection chamber extends between said ends on one side of said path and wherein said compressor housing and said impeller together define a second substantially identical collection chamber on the opposite side of said path, between said ends, said second collection chamber spiralling downwardly and inwardly from said downstream end to said upstream end, whereby the upstream end of one collection chamber serves as the downstream end of the other and vice versa.

4,919,593

RETROFITTED ROTOR BLADES FOR STEAM TURBINES AND METHOD OF MAKING THE SAME

Wilmott G. Brown, Winter Park, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 30, 1988, Ser. No. 238,439
Int. Cl.[5] F04D *29/38*
U.S. Cl. 416—223 A **7 Claims**

1. A steam turbine rotor assembly, comprising:

a rotor rotatable at a predetermined running speed which determines a harmonic series of vibratory frequencies;

at least one row of retrofitted rotor blades mounted on the

rotor and vibrating at running speed in a plurality of directions, each direction of vibration having a corresponding natural resonant frequency, and each retrofitted rotor blade having a length greater than that of the rotor blades which were originally designed for the same row;

a lower lashing wire and an upper lashing wire for lashing the retrofitted rotor blades together in groups of at least three adjacent retrofitted rotor blades per group, the upper and lower lashing wires extending between each two adjacent retrofitted rotor blades of a group;

each retrofitted rotor blade having a root portion of substantially the same size and shape as the original rotor blade, a platform portion, and an airfoil portion, the airfoil portion having a leading edge, a trailing edge, a pressure-side surface, a vacuum-side surface, a proximal end base, and a distal end tip, the configuration of the airfoil portion being defined in accordance with a plurality of equidistantly spaced plane slices transverse to the length thereof beginning at the base and ending at the tip, the area between two adjacent plane slices defining a plurality of sections, each having a center of gravity, the centers of gravity for all sections being vertically aligned;

the lower lashing wires of the retrofitted rotor blades being positioned to tune the resonant frequency of the blades with respect to one of the vibrational directions and the upper lashing wire being positioned to tune the resonant frequency of the rotor blade with respect to another of the vibrational directions, the lower lashing wire of the retrofitted rotor blades having an increased thickness compared to the lower wire of the original rotor blades;

at least one of the sections of the airfoil portion of the retrofitted rotor blade nearest the root having an increased width compared to correspondingly located sections of the original rotor blade, at least one of the sections of the airfoil portion of the retrofitted rotor blade nearest the distal end tip having a decreased width compared to correspondingly located sections of the original rotor blade;

the distal end tip of the retrofitted rotor blade being profiled;

the section next to the distal end tip of the airfoil portion of each retrofitted rotor blade and the section adjacent thereto having pressure-side and vacuum-side surfaces which are convex, and the remaining sections having concave pressure-side surfaces and convex vacuum-side surfaces; and

the position and thickness of the lower lashing wire, the number of blades in a lashed group, the width of the airfoil sections, and the profiling of the tip combining to increase the rotor blade natural resonant frequencies for the plurality of vibrational directions to frequency levels which fall between, but not in proximity to, the frequencies of the harmonic series, thereby compensating for a decrease in resonant frequency associated with the lengthening of the retrofitted rotor blade.

4,919,594

COMPOSITE MEMBER, UNITARY ROTOR MEMBER INCLUDING SAME, AND METHOD OF MAKING

E. Scott Wright, Mesa, and James G. Kenehan, Phoenix, both of Ariz., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Division of Ser. No. 51,000, May 15, 1987. This application Mar. 8, 1989, Ser. No. 320,744

Int. Cl.[5] F23C *11/00*; B23P *17/00*

U.S. Cl. 416—230 **14 Claims**

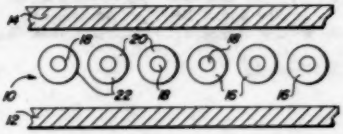
1. The method of making a ceramic fiber/metal matrix composite member of desired annular configuration including the steps of:

providing an elongate unidirectional mat of ceramic filaments;

laminating said unidirectional mat of ceramic filaments between a pair of elongate metallic foils;

consolidating said laminated unidirectional ceramic filament mat with said pair of metallic foils to form an elongate unitary composite ceramic fiber/metal matrix ribbon;

circumferentially winding said elongate ceramic fiber/metal matrix ribbon to define an annular hoop form having multiple layers of said ribbon;



enclosing said annular hoop form in a closed metallic can;

consolidating said hoop form and said metallic can to form a unitary composite workpiece; and

forming said workpiece to said desired annular configuration.

4,919,595

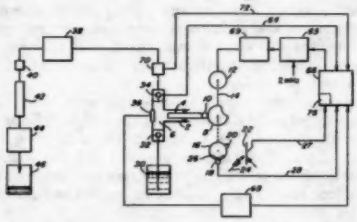
FLUID DELIVERY SYSTEM WITH DEFICIT FLOW COMPENSATION

Robert K. Likuski, Castro Valley, and Scott N. MacDonald, Pleasant Hill, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Mar. 3, 1987, Ser. No. 21,389

Int. Cl.[5] F04B *49/00*; B01D *15/08*

U.S. Cl. 417—18 **61 Claims**



1. A fluid delivery apparatus for delivering fluid to a fluid receiving system comprising:

(a) at least one pump having a piston for reciprocation within a pump chamber, said pump having a fluid inlet and a fluid outlet;

(b) isolating means for periodically isolating the outlet of said pump from the remainder of the fluid system for a period of time thereby creating a deficit flow period;

(c) refill means for refilling said pump chamber during said deficit flow period;

(d) variable piston drive means for driving said piston at various velocities;

(e) control means connected to said drive means for controlling the speed of said drive means;

(f) said control means including means for driving said drive means at a first predetermined speed during a normal delivery period to deliver fluid to said system at a normal delivery rate;

(g) deficit flow determining means for determining the quantity of fluid which would have been delivered during said deficit flow period had said pump been delivering fluid to said system at said normal delivery rate;

(h) said control means further including compensation means for driving said drive means at a second predetermined speed during a compensation period for a time sufficient to compensate for the deficiency in flow during said deficit flow period.

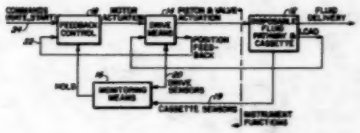
4,919,596
FLUID DELIVERY CONTROL AND MONITORING APPARATUS FOR A MEDICATION INFUSION SYSTEM

John B. Slate, Studio City, and James L. Henke, Simi Valley, both of Calif., assignors to Pacesetter Infusion, Ltd., Sylmar, Calif.

Continuation of Ser. No. 128,973, Dec. 4, 1987, abandoned. This application Apr. 26, 1989, Ser. No. 344,494

Int. Cl.[5] F04B 23/06

U.S. Cl. 417—18 14 Claims



12. The apparatus of claim 1 wherein said encoding means comprise a disk mounted to rotate with said drive means, said disk having a plurality of indicia located at selected points about its periphery for indicating rate of movement of the drive means.

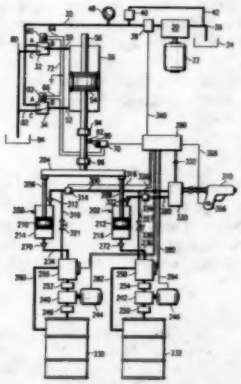
4,919,597
PUMP APPARATUS FOR MULTIPLE COMPONENT FLUIDS

Kenneth J. Kistner, Midlothian, Tex., assignor to Specified Equipment Systems Co., Inc., Dallas, Tex.

Filed Jun. 15, 1988, Ser. No. 206,658

Int. Cl.[5] F04B 9/08, 23/04

U.S. Cl. 417—403 6 Claims



1. A system for pumping one or more fluids comprising:

a drive piston for movement in a drive cylinder;

valve means for controlling the reciprocation of said drive piston by controlling the application of fluid on opposite sides of said piston, said valve means comprising two selectively controllable two-position, three port valves, the three ports being a port to inlet pressure, a port to the drive piston and a port to the non-pressurized tank, said valves being switchable between first and second positions, wherein in the first position, pressurized fluid is communicated above the piston and fluid below the piston is opened to a non-pressurized tank thereby driving said piston in a first direction and wherein in the second position, pressurized fluid is communicated below the piston and fluid above the piston is opened to a non-pressurized tank thereby driving said piston in a second direction;

pump piston means driven by the reciprocating movement of said drive piston for pumping said one or more fluids to a discharge; and

switch means for simultaneously switching both said valves to their off position wherein the drive cylinder port is connected to the tank port and wherein in said off position, spring means switches said valves to connect the cylinder port to the tank port.

4,919,598
VACUUM PUMPS

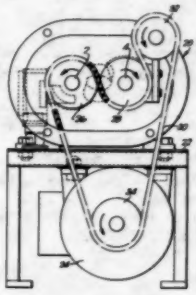
Henryk Wycliffe, Crawley, England, assignor to The BOC Group, Inc., Murray Hill, New Providence, N.J.

Filed Jul. 15, 1988, Ser. No. 219,620

Claims priority, application United Kingdom, Jul. 18, 1987, 8717006

Int. Cl.[5] F04B 9/00

U.S. Cl. 417—362 3 Claims



1. In an oil free mechanical vacuum pump including a pair of rotatable shaft supporting at least one pair of intermeshing rotors, the improvement comprising: a pair of spaced apart, rotatable driven means attached to the shafts and each having a circumference adapted to be driven for rotating the shafts; and flexible, band-like drive means passing between the driven means and on opposite sides thereof circumferentially engaged with the pair of driven means for driving the driven means and therefore, the shafts and rotors for rotation in opposite angular directions; the drive and pair of driven means having coating means for preventing slippage therebetween.

4,919,599
PUMPING SYSTEM FOR A LEAK DETECTING DEVICE

Gunter Reich, Cologne, Fed. Rep. of Germany, and William Worthington, Syracuse, N.Y., assignors to Leybold Aktiengesellschaft, Hanau, Fed. Rep. of Germany

Filed Jun. 1, 1989, Ser. No. 359,587

Claims priority, application European Pat. Off., Jun. 1, 1988, 88108769.6

Int. Cl.[5] F04D 19/04; G01M 3/20

U.S. Cl. 417—423.4 9 Claims

1. Pumping system for a leak detecting device for detecting a gas leaking from test piece by means of a gas detector and operating on the counter current principle, said system comprising

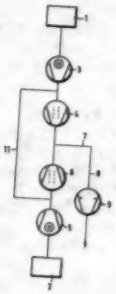
a shaft;

a first turbomolecular pumping stage on said shaft and having an inlet, to which said test piece is connected;

a first molecular pumping stage on said shaft downstream of said first turbomolecular pumping stage and connected thereto by a first passage and having an outlet;

a second turbomulecular pumping stage on said shaft and having an inlet, to which said gas detector is connected;

a second molecular pumping stage on said shaft downstream of said second turbomolecular pumping stage and connected thereto by a second passage and having an outlet in common with the outlet of the first molecular pumping stage;



a connection between said first and second passages;

a pre-vacuum pump having an inlet connected to the common outlet of the molecular pumping stages.

4,919,600

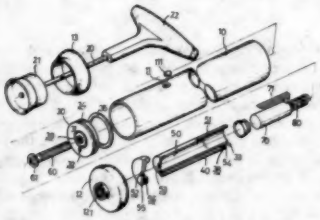
TIRE PUMP WITH A PRESSURE GAGE

Shin K. Yang, No. 20, Lane 164, Yang Ming St., Pan Chiao City, Taipei Hsien, Taiwan

Filed Jun. 29, 1989, Ser. No. 373,798

Int. Cl.[5] F04B *33/00*

U.S. Cl. 417—63 **5 Claims**



1. A tire pump with a pressure gage comprising generally a cylinder having a piston rod and a piston head slidably provided therein; a handle being fixed on a free end of said piston rod; a peep hole being formed in said cylinder; an outlet being formed at a front end of said cylinder; a pressure measuring device with a pressure indicating element being disposed at a front end of said cylinder, said pressure measuring device including a disc having a through hole, said disc being fixed within said cylinder at a substantially intermediate position thereof, said through hole being aligned with said bypass tube, a second cylinder with a second piston slidably provided therein being clamped within said front end of said cylinder by said disc, said pressure indicating element being integrally disposed on said second piston and aligned with said peep hole, and a spring member bearing between said second piston and said disc; a first air hole formed at a front end of said second piston being aligned with said outlet of said cylinder; and a bypass tube with a check valve being disposed beside said pressure measuring device such that air pressurized by said piston head flows out from said outlet through said bypass tube; said pressurized air also flowing through said first air hole so that pressure within a pumped tire is readable from said pressure indicating element of said pressure measuring device through said peep hole.

4,919,601

WAVEFORM ACTUATING AIR COMPRESSOR

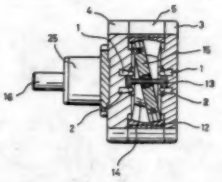
Jong D. Kim, 362, Chongdang-dong, Chonan-shi, Chungchongnam-do, Rep. of Korea

Filed Feb. 14, 1989, Ser. No. 310,745

Claims priority, application Rep. of Korea, Feb. 15, 1988, 19881581

Int. Cl.[5] F01C *3/06*

U.S. Cl. 418—51 **10 Claims**



1. A waveform actuating machine comprising:

a main casing having a cylindrical cavity in which a liner having a band-like spherical surface is inserted;

a left casing having a conical surface which forms a bearing bore with an inner partial spherical surface;

a right casing symmetrical to said left casing having a conical surface which forms a bearing bore with an inner partial spherical surface, said main casing and said left and right casings being bolted to form an air chamber;

an intake port and an exhaust port formed at concave grooves of said left and right casings; and

a tilting disc having a bearing dome on each side, said disc being inserted in said liner, journaled to an eccentric shaft, and provided with a slot for inserting a compartment plate,

wherein said compartment plate is H-shaped, having two wings formed with rectangular bores facing said intake and exhaust ports.

4,919,602

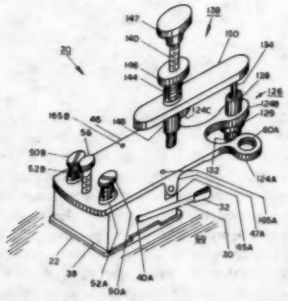
APPARATUS FOR REPAIRING WINDSHIELDS

Arthur W. Janszen, 9730 Grenadier, Houston, Tex. 77089

Continuation-in-part of Ser. No. 135,585, Dec. 21, 1987, abandoned. This application Feb. 28, 1989, Ser. No. 316,654

Int. Cl.[5] B29C *31/04, 73/24;* B32B *35/00*

U.S. Cl. 425—12 **28 Claims**



1. An apparatus to make in situ repairs with liquid resin to damage at or proximal to the surface of a shatterproof windshield, comprising:

securing means for releasably attaching said apparatus to said windshield surface,

an injector assembly for transporting said resin to said damage,

adapting means pivotally interconnecting said injector assembly with said securing means,

housing means fixedly interconnecting said securing means and said adapting means,

said adapting means having support means disposed at one end portion thereof to receive said injector assembly and having control means disposed at the other opposite end portion to control the disposition of said injector assembly with respect to said damage, and

said securing means including a substantially flat membrane comprising the bottom portion of said housing means and adapted to engage said windshield surface by creating a vacuum within said housing means.

4,919,603

DEVICE FOR REPAIRING WINDSHIELDS

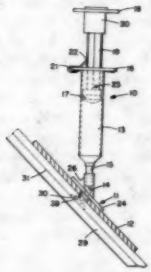
Wolf-Dietrich Herold, Seefeld, and Peter Koran, Weilheim, both of Fed. Rep. of Germany, assignors to ESPE Stiftung & Co. Produktions - und Vertriebs KG, Seefeld, Fed. Rep. of Germany

Filed May 3, 1989, Ser. No. 346,733

Claims priority, application Fed. Rep. of Germany, May 11, 1988, 8806284[U]

Int. Cl.[5] B32B *35/00*

U.S. Cl. 425—12 **10 Claims**



1. A device for repairing a damaged portion caused by a stone on a windshield by means of a liquid clear-curing synthetic resin, comprising

a syringe composed of a cylindrical casing with a discharge opening and a vent hole penetrating a wall of the casing, and a plunger movable withing said casing from a forward to a rearward position, and

sealing means for hermetically sealing said discharge opening and said damaged portion relative to the ambient atmosphere,

wherein said vent hole is disposed near the rear end of said casing remote from said discharge opening so as to communicate with the interior space of the casing between said plunger and said discharge opening when said plunger is retracted to said rearward position.

4,919,604

FINISHING TOOL

Jim Wilson, 20987 Turner Dr., Tulare, Calif. 93274

Filed Sep. 16, 1988, Ser. No. 245,040

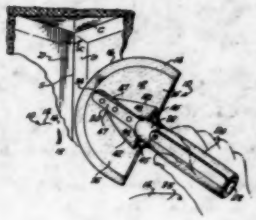
Int. Cl.[5] E04F *21/06, 21/16*

U.S. Cl. 425—458 **8 Claims**

1. A tool for finishing drywall surfaces in areas where there is a joinder of surfaces at an oblique angle, comprising:

a blade having an arcuate leading edge, a top surface and a bottom surface, said blade being formed of a relatively flexible material so that said blade is deformable to assume the contour of an area being finished;

a finishing surface formed about the periphery of said blade, said finishing surface being tapered from said top surface to said arcuate leading edge;



a handle attached to said blade to permit manipulation of said blade; and

a rigid spine means secured to said blade along a longitudinal axis thereof for rigidly supporting said blade, said rigid spine means extending from said handle to a point in proximity of said finishing surface.

4,919,605

EXTRUSION APPARATUS FOR MOLDING GUIDING TUBE FOR MEDICAL INSTRUMENTS

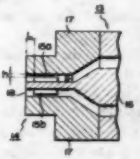
Tadashi Kousai; Yousuke Moriuchi, and Toshinobu Ishida, all of Fujinomiya, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 48,675, May 11, 1987, Pat. No. 4,830,805. This application Nov. 9, 1988, Ser. No. 269,727

Claims priority, application Japan, May 14, 1986, 61-109922

Int. Cl.[5] B29C *47/20*

U.S. Cl. 425—467 **2 Claims**



1. An extruder for producing a synthetic resin tube for guiding rod-like medical instruments into a living body, said tube having a tubular body with a circular hollow transverse cross section of a uniform thickness and being capable of positioning the rod-like medical instruments, and having at least one brittle portion and another portion, said at least one brittle portion being formed so that the splitting strength thereof is smaller than the splitting strength of said other portion over at least the entire length of the tubular body except the end thereof, said at least one brittle portion being formed of the same material as the other portion, said extruder comprising:

a die including a nozzle having means for defining a resin flow passageway of annular cross-section;

at least one baffle extending radially into said resin flow passageway and recessed 0 to 5 mm axially from an end of said nozzle, the height of the at least one baffle being at least ¼ of a height of said resin flow passageway;

whereby as the resin flow is extruded from the nozzle, the at least one baffle forms a split portion of the resin flow by substantially temporarily splitting the resin flow which is

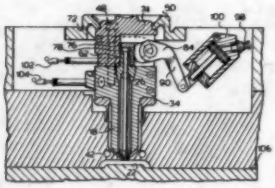
then recombined to form the brittle portion of the resin tube at the split portion of the resin flow.

4,919,606

INJECTION MOLDING RACK AND PINION VALVE PIN ACTUATING MECHANISM

Jobst U. Gellert, 7A Prince Street, Georgetown, Ontario, Canada (L7G 2X1)

Filed Dec. 21, 1988, Ser. No. 287,161
Int. Cl.[5] B29C *45/20*
U.S. Cl. 425—549 13 Claims



1. In a valve gated hot runner injection molding apparatus having a heated nozzle which is seated in a cavity plate and secured to a heated manifold, a pneumatically activated elongated valve pin which reciprocates longitudinally between a retracted open position and a forward closed position in a central bore in the nozzle which is in alignment with a gate extending through the cavity plate to a cavity, the valve pin having a driven end and a tip end which seats in the gate in the closed position, a melt passage to convey pressurized melt from an inlet in the manifold to the gate which extends through the manifold and along the valve pin in the central bore of the nozzle, and a valve pin bushing which is seated in the nozzle with a rearwardly extending portion which projects into the manifold, the valve pin bushing having a valve pin bore extending therethrough in alignment with the central bore of the nozzle to receive the valve pin therethrough to prevent substantial leakage of the pressurized melt around the reciprocating valve pin, the improvement wherein;

(a) a rack member is longitudinally slidably received in a radial opening in the manifold to engage the driven end of the valve pin, the rack member having a toothed portion with a longitudinal row of teeth which face outwardly in the radial opening;

(b) a pivotally mounted pinion member with a plurality of teeth which engage the teeth of the rack member, and

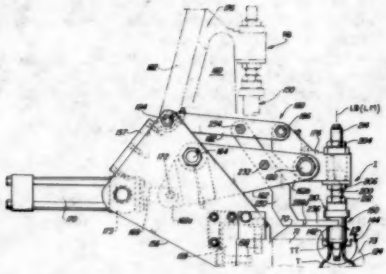
(c) double acting pneumatic actuating means connected to pivot the pinion member through a predetermined angle according to a predetermined cycle whereby the rack member and the valve pin are reciprocated longitudinally between the open and closed positions, wherein the rack member has an inward surface which abuts against a matching surface of the radial opening in the manifold to retain the rack member in longitudinal alignment with the valve pin and absorb substantially all lateral forces received from the pinion member as the rack member and valve pin are reciprocated between the open and closed positions.

4,919,607

ROTARY BLOW MOLDING MACHINE HAVING MOLD STATION BLOWING/NECK FINISHING MECHANISMS

M. Warren Martin, Saline, and Lawrence H. Weber, Ypsilanti, both of Mich., assignors to R & B Mchine Tool Company, Saline, Mich.

Filed Oct. 3, 1988, Ser. No. 252,741
Int. Cl.[5] B29C *49/58*
U.S. Cl. 425—531 26 Claims



1. A rotary blow molding machine comprising:

(a) a base,

(b) a carousel rotatably supported on the base,

(c) means for rotating the carousel,

(d) a plurality of mold stations carried on the carousel in circumferentially spaced apart relation thereon, said mold stations each comprising a pair of mold sections openable and closeable to define, when closed, a blowing cavity and a mold mouth communicating with the blowing cavity and opening outside the closed mold sections, and

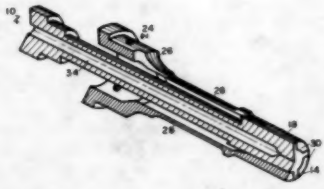
(e) blowing mechanism cooperatively associated with each mold station, said blowing mechanism having a blow pin movable between a retracted position external of the mold mouth and a blowing position inserted in the mold mouth, means for moving the blow pin in an arcuate path from the retracted position to the blowing position to insert the blow pin in the mold mouth to blow a parison received in the blowing cavity and from the blowing position to the retracted position to withdraw the blow pin from the mold mouth, and means for supplying fluid pressure to the blow pin at the blowing position.

4,919,608

MOLDING APPARATUS WITH COLLAPSIBLE CORE

Paul Catalanotti, West Newton, and Ali Lotfi, Quincy, both of Mass., assignors to Roehr Tool Corporation, Hudson, Mass.

Filed Oct. 4, 1988, Ser. No. 253,127
Int. Cl.[5] B29C *33/48*
U.S. Cl. 425—556 10 Claims



1. An injection mold apparatus which comprises:

(a) a mold having a mold cavity therein and a plastic injec-

tion inlet into the mold cavity for injection of a plastic to form a plastic article;

(b) a core assembly which comprises in combination:

(i) an axially-retractable center core pin having a first and second end and having at the first end a pin face, said axially-retractable center core pin having a plurality of elongated, equally radially-spaced apart, raised, non-collapsible segments extending to and forming part of the pin face at the first end;

(ii) a core sleeve positioned about the center core pin and having a first and a second end, said core sleeve having a core face at the first end and a base at the second end of the core sleeve and, said core sleeve further having extending from said base a plurality of elongated, equally radially-spaced apart, flexible, collapsible segments extending to the core face, the collapsible segments each having concentric, arcuate interior and exterior surfaces with radial extending side surfaces, the number of collapsible and non-collapsible segments are equal;

(iii) the collapsible segments and the non-collapsible segments in the expanded, non-collapsed position are arranged in a close, mating, alternating relationship to form a generally circular pin and core face assembly; and

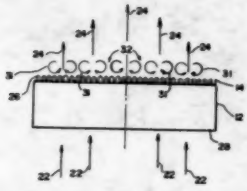
(iv) the collapsible and non-collapsible segments in the collapsed position are arranged wherein the non-collapsible segments are in an axially retracted position and the collapsible segments are in a radially inwardly collapsed relationship with the side surfaces at the core face of the collapsible segments in a close, parallel, non-touching relationship to each other, thereby permitting molding of a plastic article with a deep undercut section and non-undercut section.

4,919,609

CERAMIC TILE BURNER

Paul H. Sarkisian, Watertown, and Frederick E. Becker, Reading, both of Mass., assignors to Gas Research Institute, Chicago, Ill.

Filed May 2, 1989, Ser. No. 346,588
Int. Cl.[5] F23D *3/40, 14/12*
U.S. Cl. 431—7 **9 Claims**



1. A method of generating high specific heat output in a natural gas-fueled burner comprising:

providing a high-porosity ceramic body having an input surface, an output surface, and a multiplicity of channels substantially normal to said surfaces;

positioning a coarse metal mesh parallel to an abutting said output surface of said high-porosity ceramic body;

pumping a pressurized mixture of fuel gas and air through said high-porosity ceramic body from said input surface to said output surface;

generating with said coarse metal mesh turbulent flow of the pressurized mixture of fuel gas and air as it leaves the high-porosity ceramic burner;

igniting said pressurized mixture on said metal mesh to generate a flame; and

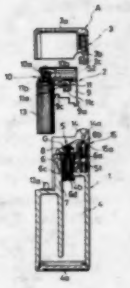
allowing said coarse metal mesh to stabilize the flame resulting from the ignition of said pressurized mixture.

4,919,610

GAS LIGHTER

Tomio Nitta, Yokohama, Japan, assignor to Tokai Corporation, Yokohama, Japan

Filed Dec. 16, 1988, Ser. No. 285,456
Claims priority, application Japan, Dec. 28, 1987, 62-197399[U]
Int. Cl.[5] F23Q *1/02*
U.S. Cl. 431—274 **1 Claim**



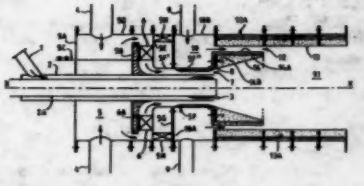
1. A gas lighter comprising a main body having a gas well, a gas-ejection valve means fixed to the ceiling of the gas well and including a vertical gas-ejection nozzle, a cap operatively connected to the gas-ejection nozzle to open and close the valve means, a fire-striking unit fixed to the top of the main body and having a rotatable file adapted to rotate in a horizontal plane, and a separate connecting pipe assembly fixed to an underside of the fire-striking unit and including a pipe having a rear end and a top end, the pipe being fitted onto and communicating with the gas-ejection nozzle at its rear end and being open at its top end in the vicinity of the rotatable file.

4,919,611

FLUID FUEL COMBUSTION PROCESS AND TURBULENT-FLOW BURNER FOR IMPLEMENTING SAME

Gérard Flament, Douai, France, assignor to Charbonnages de France, Paris, France

Division of Ser. No. 96,306, Sep. 8, 1987, Pat. No. 4,838,185, which is a continuation of Ser. No. 856,975, Apr. 29, 1986, abandoned. This application Apr. 17, 1989, Ser. No. 338,700
Claims priority, application France, May 3, 1985, 85 06750
The portion of the term of this patent subsequent to Jun. 13, 2006, has been disclaimed.
Int. Cl.[5] F23D *14/46, 1/02*
U.S. Cl. 431—350 **4 Claims**



1. Turbulent-flow burner comprising a burner outlet, a coaxial cylindrical combustion chamber delimited by a refractory

material lined confinement wall which extends downstream, a refractory material frustoconical throat, having a downstream and an upstream end, linking said burner outlet to said chamber, said frustoconical throat extending outwardly downstream at a half angle of about 10°–35°, a pipe for feeding fuel and primary air along an axis through the burner outlet, a feed device for injecting secondary air in a helical path around said axis through said burner outlet, injection means, disposed as a ring along a plane defined by said downstream end of said frustoconical throat, for injecting unheated tertiary air downstream therefrom as a continuous air jacket adjacent to extending along and confined by said confinement wall downstream of said downstream end of said frustoconical throat, means for supplying unheated tertiary air to said injecting means, said air jacket also extending substantially parallel to the direction in which the fuel is injected, said injecting means being situated coaxial with the wall of the cylindrical combustion chamber, said injecting means having between 1.8 and 3.6 times the diameter of the burner outlet and said coaxial cylindrical combustion chamber extending downstream over a length between 0.2 and 1 times its diameter, the injecting means being positioned to discharge in a plane perpendicular to said axis and being situated at a distance downstream from the burner outlet between 0.5 and 1.5 times the diameter of the burner outlet, said jacket of unheated tertiary air defining means for cooling the wall of the cylindrical combustion chamber during combustion to stabilize a flame therein.

4,919,612

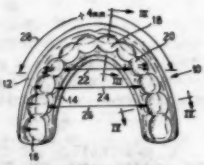
DENTAL-FORM EXPANSION APPLIANCE

Earl O. Bergersen, 950 Green Bay Rd., Winnetka, Ill. 60093

Filed Nov. 6, 1987, Ser. No. 117,565

Int. Cl.[5] A61C *7/00*

U.S. Cl. 433—6 **13 Claims**



1. An orthodontic appliance of the type which is generally U-shaped in plan view and which includes a tooth receiving trough for at least one of the upper or lower row of a patient's teeth, said trough being formed between a labial-buccal flange and a lingual flange,

said appliance being preformed with individual tooth receiving sockets for each of the canine and posterior teeth and said sockets being positioned with a lateral spacing in excess of the normal lateral tooth spacing of the patient.

4,919,613

METHOD AND APPARATUS FOR CALCINATION

David W. Watkins, Nottingham, United Kingdom, assignor to BPB Industries Public Limited Company, Slough, United Kingdom

Filed Feb. 7, 1989, Ser. No. 307,251

Claims priority, application United Kingdom, Feb. 8, 1988, 8802765

Int. Cl.[5] F27B *15/00*; B01J *8/18*

U.S. Cl. 432—58 **5 Claims**

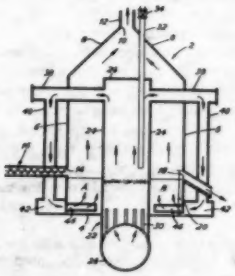
1. An apparatus for calcining calcium sulphate dihydrate or other heat-reactive material, which comprises:

a series of containers for containing respective beds of material, each of said containers having upper and lower regions;

means for feeding untreated material into a first of said containers;

means for transferring partly calcined material from said first container to a second of said containers;

means for removing calcined material from the last container of said series;



a supply of hot gas;

ducting for bringing said hot gas into indirect heat exchange relationship with said containers;

and means for introducing said hot gas from said ducting into said lower regions of said containers for fluidization of the beds therein.

4,919,614

APPARATUS FOR HEAT TREATMENT OF A SUBSTRATE

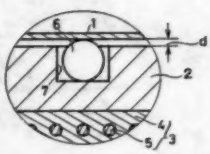
Kunio Kitagawa; Akira Maeda, and Yoshio Matsumura, all of Kyoto, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Japan

Continuation of Ser. No. 197,692, May 23, 1988, abandoned. This application Jun. 19, 1989, Ser. No. 368,923

Claims priority, application Japan, May 30, 1987, 62-85298[U]

Int. Cl.[5] F27D *5/00*

U.S. Cl. 432—259 **3 Claims**



1. An apparatus for the heat treatment of a substrate for heating or cooling the substrate, comprising:

a heat treating plate having either heating or cooling means, a main surface and a plurality of through-holes arranged spaced apart from each other by a prescribed internal;

three concave portions provided in spaced relationship with each other on a surface of said heat treating plate and each having the same depth, the positions of said three concave portions being selected so as to place said substrate a predetermined spacing above said main surface to facilitate heat exchange between said substrate and said main surface;

three balls respectively and detachably retained in said three concave portions and having the same diameter which is larger than the depth of said concave portions for placing said substrate on the top portion thereof and thereby defining said predetermined spacing; and

substrate elevating means capable of being protruded to said

main surface of said heat treating plate and being retracted from said main surface through said through-holes with said means provided with a placing portion for placing said substrate on the upper portion thereof;

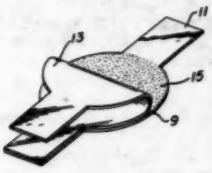
said substrate elevating means comprising a plurality of pins which are raised and lowered through said plurality of through-holes and having their upper end portions maintained at the same height, with the upper end of said plurality of pins constituting said placing portions.

4,919,615

ORTHODONTIC BAND CAP

Theodore P. Croll, 4242 Mechanicsville Rd., Mechanicsville, Pa. 18934

Filed Apr. 28, 1989, Ser. No. 344,382
Int. Cl.[5] A61C *3/00*
U.S. Cl. 433—3 2 Claims



1. In dentistry, a cap for an orthodontic band to faciltate cementation thereof, comprising:

a. a thin, flat base element having a substantially circular central portion containing a surface adhesive;

b. two or more tabs extending from the edge of said central portion, said tabs not containing any surface adhesive and being part of said base element; and,

c. a peel-off cover at least co-extensive with said surface adhesive applied to the top surface of said central portion for isolating the adhesive until it is ready for use.

4,919,616

DENTAL SPATULA WITH DISPLAY POSTS

Theodore P. Croll, 4232 Mechanicsville Rd., Mechanicsville, Pa. 18934

Filed Aug. 25, 1989, Ser. No. 398,524
Int. Cl.[5] A61C *19/10, 3/00*
U.S. Cl. 433—26 4 Claims

1. A dental spatula for mixing and displaying composite resin samples, comprising:

a. an elongate body which includes a plurality of laterally projecting display posts; and

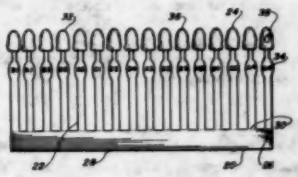
b. a spatula head at one end opposite said elongate body, said spatula head angled approximately 120 degrees with respect to said elongate body.

4,919,617

DISPOSABLE TOOTH COLOR SHADE GUIDE

Peter Antons, and Samra L. Antons, both of 2 Oak Grove, Irvine, Calif. 92714

Filed Apr. 7, 1989, Ser. No. 334,364
Int. Cl.[5] A61C *19/10*
U.S. Cl. 433—26 11 Claims



1. A disposable tooth color shade guide for identifying the industry standard color of teeth comprising:

(a) a flat thin body having a front and a back;

(b) at least one finger formed integral with said body having an extended end and an attached end;

(c) a base portion, formed integrally with said body, having perforations dividing the base from each finger at the attached end such that the finger may be removed by tearing, allowing an individual finger of the guide to be used and discarded thereafter;

(d) a distinct color shade specimen disposed upon the front extended end of each finger, each specimen having a different hue severally matching the industry standard for the majority of human teeth;

(e) an opaque outline on the periphery of each color shade specimen distinctly defining the contrast over the true tooth color; and,

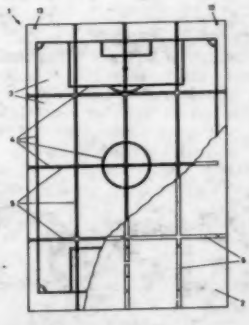
(f) indicia residing on each finger connotating the customary standard shade of each specimen allowing a tooth to be matched in color when being replaced by a dental prosthesis.

4,919,618

GAME BOARD WITH PLAYER FIGURES FOR TEACHING TEAM SPORTS

Ole Andersen, Oberstmuhle 3, CH-6370 Stans, Switzerland

Filed Feb. 22, 1989, Ser. No. 313,528
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1988, 8813456[U]
Int. Cl.[5] G09B *1/06*
U.S. Cl. 434—251 7 Claims



1. A game board with player figures for teaching team sports, said board comprising:

field markings of a playing field drawn thereon at a reduced

scale and wherein the figures can be disposed removably on the board;

a foldable, flat support;

rectangular plastic plates, glued on the support at a distance from each other forming gaps on the support between the plates, the gaps between the plates forming fold lines in the support along which the game board can be folded, said plates being rigid in comparison with the support and having smooth surfaces on which the field markings are disposed; and

wherein the figures consist of a laminate of a thin adhesive foil at a back side thereof and a thicker plastic foil laminated on the adhesive foil.

4,919,619

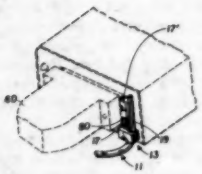
LOCAL AREA NETWORK TRANSCEIVER CABLE LOCK

Conrad Chompff, Concord, Calif., assignor to A 'n D Cable Products, Inc., Concord, Calif.

Filed Mar. 29, 1989, Ser. No. 330,146

Int. Cl.[5] H01R *13/639*

U.S. Cl. 439—371 **11 Claims**



1. A device for preventing the accidental release of the electrical connection between a multihole female electrical connector from its counterpart multipin male connector, which connection is to be maintained by the disposition of an IEEE 802.3 standard slidelock, which slidelock includes a side mounted U-shaped flange on each side thereof, a bigger one and a smaller one and which slidelock is disposed on one of said connectors in engagement with one of a pair of spaced posts disposed spaced from the connector not having the slidelock thereupon;

which device comprises a slidelock retention means which engages said slidelock and is interposed between the smaller of said U-shaped flange and one of either the top or bottom flanges and one of said studs,

wherein the slidelock retention means comprises:

a head section which may be generally rectangular and which is attached to the main body portion, extending axially therefrom are a spaced pair of parallel locking fingers, an inner finger and an outer finger.

4,919,620

CONNECTOR DEVICE FOR A STEERING SYSTEM

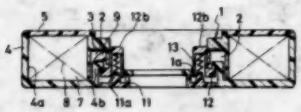
Kiichi Yamaguchi, and Takehiko Itoh, both of Toda, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Mar. 31, 1989, Ser. No. 332,633

Claims priority, application Japan, Jun. 20, 1988, 63-80572[U]

Int. Cl.[5] H01R *35/04*

U.S. Cl. 439—15 **4 Claims**



1. A connector device for a steering system comprising an inner compartment and an outer compartment formed between a movable member and a fixed member which are rotatably connected to each other, said inner compartment accommodating a conductor plate and a scraper electrically engaged with said conductor plate, whereas said outer compartment accommodates a cable wound in a plurality of turns, said conductor plate and said scraper being moved relative to each other as the movable member is rotated and at the same time said cable is being wound or unwound according to the direction of rotation of said movable member, wherein said device further comprises a partition wall provided on said fixed member projecting into said inner compartment for rigidly fixing either said conductor plate or said scraper to an upper surface of said partition wall, an anchoring member located along the inner periphery of said partition wall, a stopper member provided on said movable member and resiliently biased against said anchoring member to prevent movement between said fixed and movable members, and an unlocking member being provided on said stopper member for releasing said stopper member from said anchoring member as external equipment presses against said unlocking member.

4,919,621

PLUG AND SOCKET TYPE CONNECTOR FOR CONNECTING AN ENDOSCOPE TO SUPPLY UNITS

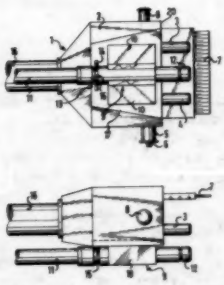
Felix Ams, Kümpfelbach, Fed. Rep. of Germany, assignor to Richard Wolf, GmbH, Fed. Rep. of Germany

Filed Nov. 16, 1988, Ser. No. 271,924

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1987, 3738633

Int. Cl.[5] A61B *1/06*

U.S. Cl. 439—191 **8 Claims**



1. A plug and socket type connector for connecting an endoscope to supply units including light projectors, pumps and electrical generators, said connector comprising a casing incorporating at least one connection for coupling to at least one corresponding connection of at least one supply unit, and a reception device having means for releasably clamping a plug connection of a light conductor cable on one side of the casing, said reception device being releasably connected to said one side of the casing.

4,919,622

INSULATION DISPLACING TERMINAL

Louis Suffi, Westchester, Ill., assignor to Reliance Comm/Tex Corporation, Cleveland, Ohio

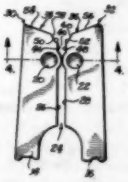
Filed Mar. 30, 1989, Ser. No. 330,621

Int. Cl.[5] H01R *4/24*

U.S. Cl. 439—395 **6 Claims**

1. A clip-type electrical terminal comprising a base, at least two substantially parallel resilient cantilever beam members attached to the base and longitudinally projecting outwardly therefrom, said beam members being elongated in the direction of their projections from the base; means for separating said beam members to form a gap therebetween and to define fac-

ing inner edges thereof; said beam members defining outer ends of the terminal, which outer ends form a notch having a first pair of beam member edge portions that form a funnel-like angle; a guide channel defined by said gap extending inwardly from said notch and between said facing inner edges of said beam members, a second pair of beam member edge portions comprising parts of said facing inner edges of said beam members bordering said guide channel portion being substantially parallel with each other and spaced apart and contiguous with the first-mentioned edge portions, such that said guide channel is coextensive with at least a portion of the gap formed between said beam members by said separating means; said second pair of beam member edge portions defining a wire-insulation slicer having sharp edges at the intersection of said second beam member edge portions and the first beam member edge



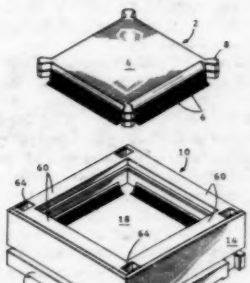
portions such that an insulated wire, upon entering said notch, is guided by the notch and guide channel to the insulation slicer so as to have the insulation sliced therefrom as the wire passes through the guide channel; said base and said beam members being formed as a one-piece, substantially flat structure of substantially constant thickness; wherein said separating means comprises a pair of aligned bosses formed repectively in said two beam members adjacent said facing inner edges thereof so as to deform material of each said beam member toward the other to thereby cause said resilient beam members to spread apart to define said gap therebetween; said bosses being formed at an area of said beam members between said guide channel portion and a remaining portion of said gap in which said wire is held following the slicing of insulation therefrom.

4,919,623

BURN-IN SOCKET FOR INTEGRATED CIRCUIT DEVICE

Timothy B. Billman, King, and Joseph R. Goodman, Walkertown, both of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 13, 1989, Ser. No. 310,254
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—70 **24 Claims**



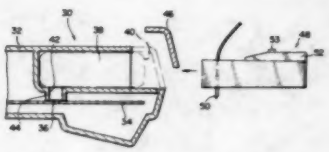
1. A socket for establishing electrical interconnection to an electrical component having a plurality of contact leads protruding from the body of the component; comprising an insulative housing, a cap shiftable relative to the insulative housing, and a plurality of contact terminals mounted in the housing, the cap engaging the contact terminals during movement of the cap relative to the insulative housing to shift the terminal from a first to a second position to permit insertion of the electrical component into the socket, each terminal having outwardly facing contact means for engaging a corresponding contact lead on an inner surface of the contact lead adjacent to the component body when the contact terminal is in the first position, movement of the terminal from the first to the second position being accompanied by corresponding movement of said outwardly facing contact means.

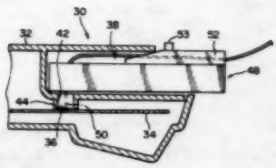
4,919,624

CONNECTION TERMINAL STRUCTURE OF ELECTRONIC EQUIPMENT

Hitoshi Masuda, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed May 26, 1989, Ser. No. 357,360
Claims priority, application Japan, May 31, 1988, 63-71981[U]
Int. Cl.[5] H01R *23/72*; H05K *1/18*
U.S. Cl. 439—76 **9 Claims**





1. A connection terminal structure of electronic equipment having a casing, a printed circuit board mounted in said casing, and a battery containing section formed in said casing and having a battery inlet/outlet, comprising:

an opening formed through a part of the casing which constitutes a bottom wall of the battery containing section and being covered by another part of said casing which constitutes an upper wall of said battery containing section; and

conductive terminal members provided on the printed circuit board which is spaced apart from said bottom wall by a predetermined distance and being so positioned as to face said opening.

4,919,625

TRACK LIGHTING APPARATUS

Leonard J. Coutre, Chicago, Ill., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Apr. 29, 1988, Ser. No. 187,808
Int. Cl.[5] H01R *25/14*
U.S. Cl. 439—118 **41 Claims**

1. Track lighting apparatus comprising in combination,

a longitudinal track section having a body with a right end and a left end and having a lateral cross section defined by

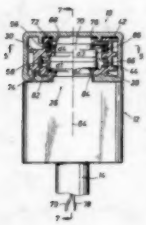
first and second lateral sides, a top side of top width and a bottom side having a slot of width smaller than said top width, said sides defining a channel within said track which is open from beneath said track via said slot,

a first insulator structure disposed within said channel adjacent said first lateral side, said first insulator structure carrying a neutral bus facing inwardly of said channel at a first lateral distance from said first lateral side and carrying a ground bus facing inwardly of said channel at a second lateral distance from said first lateral side, said ground bus being vertically separated from said neutral bus,

a second insulator structure disposed within said channel adjacent said second lateral side, said second insulator structure carrying vertically separated first and second voltage busses which face inwardly of said channel at substantially identical lateral distances from said second lateral side; and

a plug box with a contact head having a lateral width smaller than said slot of said track and adapted for insertion into said channel of said track via said slot in said bottom side of said track section,

said contact head carrying a neutral electrical contact on one longitudinal side, a voltage electrical contact on an opposite longitudinal side, and a ground electrical contact on



said one longitudinal side on which said neutral electrical contact is carried, said ground electrical contact being vertically separated from said neutral electrical contact by a distance corresponding to the vertical separation between said ground bus and said neutral bus of said track section,

said voltage electrical contact being moveable between a first fixed vertical position and a second fixed vertical position, the distance between said first vertical position and said second vertical position corresponding to the vertical separation of said first and second voltage busses of said track,

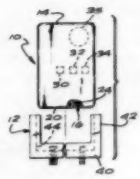
whereby on insertion of said contact head of said plug box into said slot with longitudinal alignment of said head with said track, and after ninety degree rotation of said head within said channel such that said neutral contact and said ground contact of said head turns toward said neutral bus and said ground bus and said voltage contact turns toward said first and second voltage busses, electrical contact is established between said neutral contact of said head and said neutral bus of said track, between said ground contact of said head and said ground bus of said track, and between said voltage contact of said head and either of said first or second voltage busses of said track, depending upon whether said voltage contact is in its first fixed vertical position or its second fixed vertical position.

4,919,626

CONNECTOR FOR IC CARD

John W. Anhalt, Orange, and David S. Goodman, Mission Viejo, both of Calif., assignors to ITT Corporation, New York, N.Y.

Filed Apr. 14, 1989, Ser. No. 338,030
Int. Cl.[5] H01R *13/15*
U.S. Cl. 439—260 **4 Claims**



1. A connector for receiving an IC card having an edge on a side of the card formed with an elongated slot containing a substrate having a row of spaced conductors thereon adjacent to the edge of the substrate, comprising:

an insulative housing having an upper surface and a lower surface, a channel in said housing opening at said upper surface and adapted to slidably receive therein the side of said card with its edge adjacent to the bottom of said channel;

a row of contacts mounted in said housing having spring sections spaced apart a distance corresponding to the spacing of the conductors on said card and extending upwardly into said channel for insertion into said slot;

each of said spring sections being reversely bent to form an inner arm and an outer arm joined by a nose portion;

said nose portion of each said contact being curved and joined to said outer arm by a relatively short inwardly and rearwardly extending connecting segment;

said inner arms being positioned in said channel so as to be out of the path of said substrate when the card is initially inserted into the connector;

said outer arms of said contacts extending toward one side of said channel; and

said outer arms being engageable by the card to cam said outer arms, and hence said inner arms, inwardly into engagement with the conductors on the substrate, after said nose portions of said contacts pass a border region of the substrate adjacent to the edge of the substrate when the card is inserted into the connector.

4,919,627

ELECTRICAL CONNECTOR

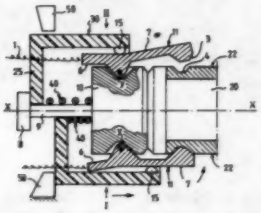
Neil Cable, Leiden, Netherlands, assignor to Agence Spatiale Europeenne, Paris, France

Filed Nov. 17, 1988, Ser. No. 272,668
Claims priority, application France, Dec. 2, 1987, 8716706
Int. Cl.[5] H01R *13/627*
U.S. Cl. 439—263 **4 Claims**

1. An electrical connector having circular symmetry about a longitudinal axis, comprising first and second insulating supports each equipped with at least two terminals, said first support having first terminals and said second support having second terminals, said terminals being connected to electrical conductors, said first and second insulating supports being intended to be assembled and disassembled by being moved axially towards each other and away from each other in order respectively to make and to break electrical contacts between corresponding first and second terminals by mutual engagement or disengagement thereof, said connector including the improvements whereby said first terminals are mounted for pivoting movement relative to said first support while said second terminals are fixed relative to said second support, and whereby said connector includes actuator means responsive to

the application of an axial force to cause said first terminals to pivotally move:

in response to an axial force in a first direction, from a first position in which both insulating supports are axially aligned and are assembled to each other, with the first terminals being held intimately engaged with said second terminals, to a second position in which both supports are still assembled to each other while the first terminals are pivoted away from said second terminals to completely disengage from the fixed terminals; and



vice versa, from said second position to said first position, on application of an axial force in a second direction opposite to said first direction;

thereby enabling the two supports, when axially aligned, to be disassembled by being moved axially away from each other and to be assembled by being moved axially towards each other without any friction forces being generated between said first terminals and said second terminals during the axial disassembly and assembly movements, which movements take place while said first terminals and second terminals are fully disengaged.

4,919,628

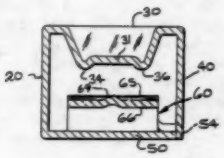
TAB RECEPTACLE WITH FIXED BEAM CONTACTS

Dewey F. Mobley, Lake Orion; Robert G. Peterson, Sr., Canton, and James E. Mergless, Utica, all of Mich., assignors to Interlock Corporation, Westland, Mich.

Continuation-in-part of Ser. No. 110,225, Oct. 19, 1987, abandoned. This application Apr. 18, 1989, Ser. No. 340,132

Int. Cl.[5] H01R *11/22*

U.S. Cl. 439—858 **7 Claims**



1. A tab receptacle fabricated by bending a single sheet of metal comprising:

a rectangular receptacle box having a closed continuous wall forming an end opening through which a male tab terminal is inserted so as to make contact with said receptacle box, said receptacle box including a bottom, a top, and sides;

fixed beams formed in said top extending toward said bottom for engagement with one side of said male tab terminal, said fixed beams lying parallel to the axis of male tab terminal insertion;

a cantilever supported movable beam member formed between said top and said bottom by a portion of said sheet of metal folded into the interior of said box for engagement with the other side of a male tab terminal, said beam member including a front end portion located adjacent said end opening, a middle portion, and a rear portion attached to said box;

said rear portion being inclined upward toward said top of said box, said middle portion being substantially parallel to said bottom, and said front end portion being inclined downward toward said bottom;

said beam member having contact with said male tab terminal at spaced points along said beam member when said male tab terminal is inserted into said box; and

said front end portion of said beam member coacting with said bottom when said male tab terminal is inserted so as to fix said beam member is opposition to said fixed beams in said top.

4,919,629

STEERING DEVICE FOR MARINE PROPULSION

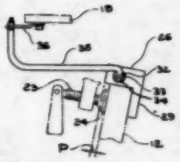
Atsushi Isogawa, and Yukio Sumigawa, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Feb. 1, 1988, Ser. No. 150,548

Claims priority, application Japan, Jan. 31, 1987, 62-19665

Int. Cl.[5] B63H *21/26*

U.S. Cl. 440—62 **11 Claims**



1. A steering device for a marine propulsion device affixed relative to the transom of a watercraft, said propulsion device comprising a drive shaft housing rotatably journaling an engine driven shaft, a swivel bracket journaling said drive shaft housing for steering movement about a generally vertically extending steering axis, a generally "C" shaped clamping bracket adapted to receive the upper end of the transom for affixing said propulsion device to the transom, pivot pin means interconnecting said swivel bracket and said clamping bracket for pivotal movement about a generally horizontally extending tilt axis, and a steering arm affixed to said drive shaft housing, the improvement comprising a steering bracket affixed between a downwardly extending face of said clamping bracket and an upwardly extending face of the transom, said clamping bracket extending over said steering bracket for direct attachment to the transom, said steering bracket defining a bore extending generally parallel to and offset from said tilt axis, a steering rod slidably supported in said bore for reciprocation relative thereto, means for affixing an operator controlled steering cable to said steering rod for effecting operator controlled reciprocation of said steering rod, and means connecting said steering rod to said steering arm for steering of said drive shaft housing upon reciprocation of said steering rod.

4,919,630

INBOARD DRIVE SYSTEM FOR A MARINE CRAFT

Adam Erdberg, 3205 N.E.188 St., North Miami Beach, Fla. 33180

Continuation-in-part of Ser. No. 613,441, May 24, 1984, abandoned. This application Jun. 26, 1989, Ser. No. 371,140

Int. Cl.[5] B63H *21/26*

U.S. Cl. 440—79 **6 Claims**

1. An inboard drive system for a marine craft comprising in combination:

(a) two drive engines mounted inboard of said craft in spaced relation from a stern portion thereof and in speed and

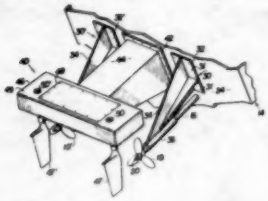
substantially adjacent relation to a center of gravity of said craft,

(b) a power take-off coupling mounted on each of said drive engines on substantially one end thereof, said power take-off coupling and said one end of said drive engines disposed in facing relation to the stern portion of the craft,

(c) drive shaft means for drivingly interconnecting a propeller means to said drive engines and comprising two drive shafts of one piece construction , each connected at one proximal inboard end thereof to a respective one of said power take-off couplings associated with said respective drive engines when extending outwardly therefrom through a transom of the craft,

(d) said propeller means comprising two drive propellers each secured to a distal end of a different one of said drive shafts, said drive shafts each disposed at an angular orientation relative to a longitudinal axis of the craft sufficient to dispose said propellers in a surface piercing orientation during travel of the craft,

(e) support means comprising two support struts each fixedly secured to and extending outwardly from the transom of the craft and outboard thereof in substantially



depending position, each of said support struts rotatably supporting one of said distal ends of one of said respective drive shafts substantially adjacent said propeller means,

(f) steering strut means mounted to the transom of the craft outboard thereof for support of a steering assembly and a rudder assembly thereon and including a support arm disposed between said two support struts and spaced therefrom and a housing secured to one end of said support arm and disposed in transverse relation thereto,

(g) said housing substantially enclosing said steering assembly and having said rudder assembly depending downwardly therefrom, said rudder assembly comprising two rudders each disposed in spaced relation to one another and in aligned relation to one of said drive propellers and operatively connected to said steering assembly, and

(h) said support strut means secured to the transom in spaced apart relation to said housing and structured independently of said steering strut means for independent and aligned placement of said propeller means relative to said two rudders and for independent securement of said support struts in relation to said steering strut means on said transom.

4,919,631

UNDERWATER DIVING SYSTEM

Michael V. Stafford, 419 Main St., Suite 212, Placerville, Calif. 95667

Filed May 5, 1988, Ser. No. 190,631

Int. Cl.[5] B63C *11/20*

U.S. Cl. 441—40 **27 Claims**

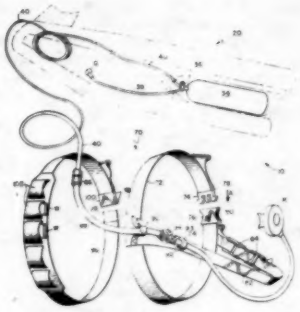
1. An underwater diving system, comprising in combination:

a light-weight raft,

a source of compressed gas embodied as a scuba type tank of compressed gas normally carried on the back of a diver carried on said raft,

a gas line from said source to an underwater diver,

and harness means connecting an end of said line, remote from said gas source, to the diver,



whereby while the diver explores underwater, said raft is towed along and forces associated with towing are dissipated by said harness.

4,919,632

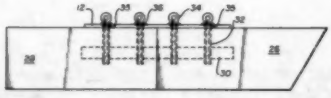
COLLAPSIBLE ONE-MAN PONTOON FISHING RAFT

Richard L. Smith, 1800 Bancroft, Missoula, Mont. 59801; Frederick Wallner, 40 Scovel La., Kalispell, Mont. 59901, and Alvern C. Weed, 412 Boston Ct., Davenport, Iowa 52806

Filed Jan. 17, 1989, Ser. No. 297,932

Int. Cl.[5] B63B *7/04*

U.S. Cl. 441—44 **6 Claims**



1. A collapsible one-man pontoon fishing raft comprising:

at least two, spaced, flotational pontoons, said pontoons being of solid construction,

means for maintaining the spaced relation between pontoons comprising a one-piece seat having at least two holes near each end which, when said seat is placed on the top surface of said pontoons, will mate with corresponding holes and sleeves in the top surface of the pontoons,

securing pins adapted to pass through the holes in the seat and into the holes in the pontoons, said securing pins being of such dimension that they will frictionally engage the sleeves in the holes in the top surface of the pontoons and such that the top of said pin will not pass through the holes in the seat.

4,919,633

LIQUID CRYSTAL DEVICE WITH A FERROELECTRIC FILM AND METHOD FOR MANUFACTURING THE SAME

Shumpei Yamazaki, Tokyo; Masashiko Sato, Atsugi, and Hiroyuki Sakayori, Machida, Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Division of Ser. No. 94,872, Sep. 10, 1987. This application Apr. 20, 1988, Ser. No. 184,009

Claims priority, application Japan, Sep. 19, 1986, 61-221180; Dec. 2, 1986, 61-288527

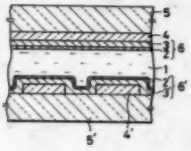
Int. Cl.[5] H01J *9/00*

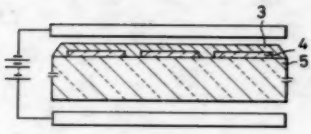
U.S. Cl. 445—24 **5 Claims**

1. A method of manufacturing a liquid crystal device comprising: preparing a substrate;

coating said substrate with a ferroelectric material film consisting of a mixture of a ferroelectric material and a organic resin;

applying an electric field to said ferroelectric film in a direction perpendicular to said substrate;





curing said ferroelectric film;

mating said substrate with an opposite substrate; and

disposing a liquid crystal layer between said substrates.

4,919,634

METHOD OF FABRICATING ELECTRODE OF COLOR PICTURE TUBE ELECTRON GUN

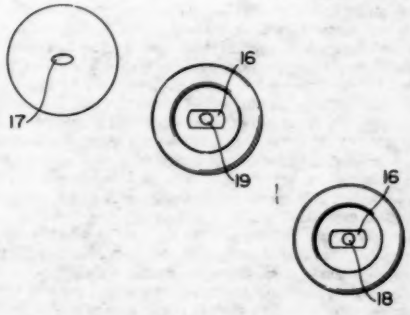
Masahiro Ito, Chiba, and Satoru Endo, Mobara, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 94,698, Sep. 9, 1987, abandoned. This application May 15, 1989, Ser. No. 352,607

Claims priority, application Japan, Sep. 12, 1986, 61-213838

Int. Cl.[5] H01J *9/02*

U.S. Cl. 445—49 **20 Claims**



1. A method of fabricating an electrode of a color picture tube electron gun, said electrode having an aperture for passing an electron beam and a single focusing recess associated with the aperture and having a predetermined width a depth formed in a surface of a single metal plate, said single focusing recess having a predetermined length extending in a predetermined direction substantially symmetrically with respect to an axis of said electron beam pass aperture comprising the steps of:

forming in said metal plate a laterally elongated through hole of substantially ellipitical configuration being substantially symmetrical with the axis of said electron beam pass aperture and having a major diameter in a longitudinal direction of said recess, before said recess is formed;

forming said single focusing recess at a peripheral wall area of said laterally elongated through hole through a coining process; and

forming said electron beam pass aperture by removing a wall portion of said through hole existing after completion of the coining process to form a through hole of a predetermined shape.

4,919,635

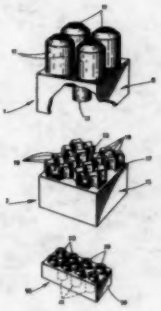
TOY CONSTRUCTION ASSEMBLY

Vic Bertrand, Ile Bizard, Canada, assignor to The Ritvik Group Inc., Dorval, Canada

Filed Dec. 19, 1988, Ser. No. 286,852

Int. Cl.[5] A63H *33/08*

U.S. Cl. 446—128 **11 Claims**



1. A toy construction kit comprising;

a first block having a hollow box-like first base defined by sidewalls, a top wall and an open end facing said top wall; an even number of at least four identical primary cylindrical coupling studs projecting upwardly from said top wall, each group of four of said primary coupling studs adjacent each other having axes disposed at the four corners of a first square; and at least one secondary cylindrical coupling stud projecting downwardly from said top wall within said first base, each secondary stud being coaxial with the center of each first square;

a second block having a hollow box-like second base defined by sidewalls, a top wall and an open end facing said top wall; at least one group of four identical primary coupling elements projecting upwardly from said second top wall and disposed around a central axis normal to said top wall, each of said coupling elements having an outer configuration o in the form of a polygonal figure comprising one inner concave wall and at least three outer concave walls, said inner wall located proximally with respect to said central axis and said outer walls located distally with respect to said central axis, said inner concave walls of each group o four coupling elements defining four arcs of a common circle the diameter of which is equal to the outer diameter of said secondary stud of said first block;

wherein said second block is constructed so that said secondary stud of said first block is capable of being gripped between said primary coupling elements of said second block, said outer walls of said primary coupling elements defining lengthwise ridges, and adjacent sidewalls of said first base having lengthwise corner ribs spaced apart a distance suitable for said ribs to slide along said ridges of

said elements when said secondary stud of said first block is gripped between said coupling elements; and

a third block having a hollow box-like third base defined by sidewalls, a top wall and an open end facing said top wall; an even number equal to at least four of identical primary cylindrical coupling pugs projecting upwardly from said third base top wall, the primary coupling plugs of each group of four of said primary coupling plugs adjacent each othc. having their axes disposed at the four corners of a third square, and a secondary cylindrical coupling plug projecting downwardly from said top wall within said third base, said secondary plug being coaxial with the center of said third square; and

wherein said second hollow base is sized from fitting snugly over at least one of said primary plugs of said third block.

4,919,636

WATER TOY

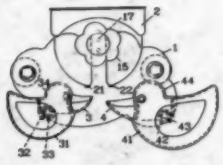
Lennart Dahlgren, Askims Utsiktsväg 10, S-436 00 Askim, Sweden

Filed Feb. 6, 1989, Ser. No. 306,935

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1988, 3803306

Int. Cl.[5] A63H *23/00, 29/10, 3/18*

U.S. Cl. 446—159 **24 Claims**



1. A water toy, comprising:

(A) a base which includes a pivot member;

(B) a main tank connected to the base, the tank including: (1) a first outlet for draining water from the tank at a first flow rate and (2) a second outlet for draining water from the tank at a second flow rate, the second flow rate being different from the first flow rate;

(C) a first pivotable object, including: (1) a main body, (2) a first collecting tank for collecting water drained through the first outlet, and (3) bearing means for pivotably supporting the object on the pivot member, the bearing means being located within the main body so that (a), when the collecting tank is empty, the object is balanced with the collecting tank in position to collect water drained through the first outlet and (b), as the collecting tank collects water, the object becomes unbalanced and pivots by gravity around the pivot member to an unbalanced position in which water is emptied from the collecting tank, the bearing means cooperating with the pivot member so that, as the object pivots around the pivot member, a surface of the bearing means slides across the pivot member to further unbalance the object to increase the abruptness of the pivoting of the object; and

(D) a second pivotable object which includes a second collecting tank for collecting water drained through the second outlet, the second object being pivotably supported with respect to the base so that (a), when the second colleting tank is empty, the second object is balanced with the second collecting tank in position to collect water drained through the second outlet and (b), as the second collecting tank collects water, the second object becomes unbalanced and pivots by gravity to an unbalanced position in which water is emptied from the second collecting tank.

4,919,637

MODEL SUBMARINE

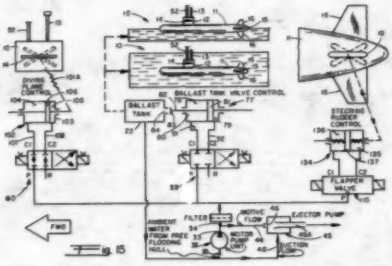
Lewis W. Fleischmann, Randallstown, Md., assignor to Leonard Bloom, Towson, Md., a part interest

Continuation-in-part of Ser. No. 865,790, May 22, 1986, Pat. No. 4,826,465. This application Dec. 12, 1988, Ser. No. 285,655

The portion of the term of this patent subsequent to May 2, 2006, has been disclaimed.

Int. Cl.[5] A63H *23/04, 27/06;* B63G *8/22*

U.S. Cl. 446—162 **38 Claims**



1. A model submarine comprising a hull provided with a sail and a periscope, the hull having a plurality of apertures formed therein, such that ambient water may enter through the apertures, and such that the interior of the hull is free-flooding, a sealed battery within the hull, a single submersible motor-pump unit within the hull and adapted to be energized by the battery, the motor pump-unit having an intake means in communication with the interior of the hull and further having a pressurized discharge means; whereby the motor-pump unit, when energized, continually draws ambient water out of the free-flooding hull, and whereby the ambient water is replenished in the hull through the apertures therein, an ejector pump carried by the hull, the ejector pump having an inlet port connected to the pressurized discharge means of the motor-pump unit and further having a discharge nozzle communicating with the ambient water externally of the hull, such that the continuous discharge of the ambient water out of the hull through the discharge nozzle of the ejector pump facilitates the forward propulsion of the submarine in the water, a ballast tank within the hull, conduit means communicating the ballast tank with the ejector pump and including a vacuum port, whereby when the ejector pump discharges pressurized water through its discharge nozzle and out of the hull, a suction is created in the vacuum port, thereby causing the ejector pump to aspirate fluid out of the ballast tank, a selectively-operable flood control valve means including a first diaphragm actuator for communicating the ballast tank with the interior of the free-flooding hull upon a given command; wherein when the flood control valve means is actuated, water flows into the ballast tank at a faster rate than the rate at which water is aspirated out of the ballast tank by the ejector pump, such that the ballast tank becomes completely filled with ambient water, buoyancy means within the free-flooding hull and adapted to trim the submarine to a slightly positive buoyancy when the ballast tank is fully flooded, such that the submarine is still slightly buoyant and is adapted to partially submerge to a periscope depth just under the surface with only its periscope above the water, articulatable diving planes carried by the submarine externally thereof and adapted to have a neutral position defined by a substantially zero angle of attack, selectively-operable diving actuating means including a second diaphragm actuator communicating with the pressurized discharge of the motor-pump unit for articulating the diving planes to a negative angle of attack to cause the submarine to dive below periscope depth upon another given command, means responsive to ambient water pressure for sensing the

depth to which the submarine has submerged, thereby providing a force which increases at greater depths for countering the second diaphragm actuator and causing the diving planes to again assume a substantially neutral position when the desired depth has been obtained, such that the submarine will substantially level off and maintain its submerged depth until a new command is given to the articulatable diving planes, a rudder on the hull, selectively-operable steering control means including a third diaphragm actuator in communication with the pressurized discharge of the motor-pump unit for controlling the rudder upon a further command; each of the first, second and third diaphragm actuators having respective sides; the respective selectively-operable flood control valve means, diving initiating means, and steering control means being adapted to admit pressurized water from the discharge means of the motor-pump unit to one side or the other of the first, second and third diaphragm actuators, respectively, for selectively controlling the submerging, diving and steering of the submarine, respectively; and a receiver means on the submarine for receiving the command signals from a remote transmitter for selectively controlling the flood control valve means, diving initiating means, and steering means, respectively; whereby the submersible motor-pump unit, supplying the pressurized water, constitutes the sole power source for forward propulsion of the submarine, for taking on and discharging water ballast for surfacing, and for diving and steering, respectively; and whereby if the submarine engages an obstruction, or if the motor-pump unit fails, or if the battery becomes discharged while the submarine is fully submerged within the water, the submarine is adapted to automatically rise within the water to its periscope depth, thereby providing a fail-safe feature and enabling the submarine to be retrieved conveniently.

4,919,638

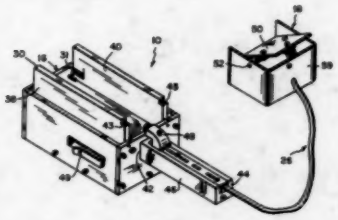
REMOTELY CONTROLLED TOY FOR CAPTURING APPARITIONS

Jeffrey L. Long, 30 Celeste Ave., Holbrook, N.Y. 11741

Filed Jun. 19, 1989, Ser. No. 367,762

Int. Cl.[5] A63H *33/00*

U.S. Cl. 446—490 **13 Claims**



1. A remotely controlled toy for capturing apparitions, comprising:

(a) containment means having an opened position and a closed position, said containment means include a containment box, said containment box has a top that is a pair of pivotally mounted doors for providing said opened position and said closed position;

(b) activating means disposed a distance from said containment means, said activating means include a step box; and

(c) means for connecting said containment means to said activating means so that

4,919,639

TOY VEHICLE

Kurt Hesse, Waldstrasse 36, 8510 Furth, Fed. Rep. of Germany

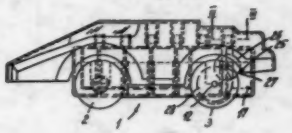
PCT No. PCT/EP87/00752, § 371 Date Nov. 9, 1988, § 102(e) Date Nov. 9, 1988, PCT Pub. No. WO88/05327, PCT Pub. Date Jul. 28, 1988

PCT Filed Dec. 3, 1987, Ser. No. 271,778

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1987, 3702043; Jan. 24, 1987, 3702040

Int. Cl.[5] A63H *17/00, 17/267*

U.S. Cl. 446—462 **8 Claims**



1. A toy vehicle comprising:

a chassis which is adapted to travel by means of wheels on a driving surface;

a body is adapted to be fastened on the chassis the vehicle chassis comprising a plurality of first pegs fixed on the side towards the body at a distance adjacent to each other;

the vehicle body comprising a plurality of first sleeves fixed on the side towards the chassis at the same distance and in relation to the plurality of first pegs which can be pushed onto the plurality of first pegs of the vehicle chassis so they are frictionally engaged;

the vehicle chassis being formed boxlike by two vehicle chassis parts disposed on top of each other and connectable in a plane parallel to the plane of a driving surface, both of which are connected by means of second pegs disposed on one chassis part and second sleeves provided on the other chassis part which can be pushed on the second pegs, wherein the one chassis part comprises a reception chamber containing a low voltage power source and a reception space containing a drive motor and the other chassis part comprises electric conductors extending into said reception chamber and a switching device providing or interrupting electrical contact between the drive motor and one of said electric conductors.

4,919,640

AUTO TUNING APPARATUS

Masami Yanagibori, Chiba, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 21, 1988, Ser. No. 247,377

Claims priority, application Japan, Sep. 22, 1987, 62-238254

Int. Cl.[5] H04B *11/16, 1/26*

U.S. Cl. 455—164 **4 Claims**

1. Auto tuning apparatus for automatically determining a correct tuning point of an intermediate frequency carrier of a received signal, said apparatus comprising:

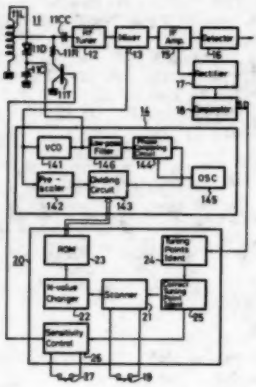
a local oscillating circuit for adjusting the IF carrier of the received signal having a phase locked loop configuration and including a variable frequency-dividing circuit having a frequency dividing ratio 1/N, where N is a positive integer, and means for sequentially varying the value of N;

detecting means for detecting a plurality of tuning points of said intermediate frequency carrier;

scanning means responsive to said detecting means for carrying out a scan of said plurality of tuning points by varying a tuning detecting threshold value relative to a level of said received signal;

means responsive to said scanning means for determining said correct tuning points and causing the sequential variance of N; and

sensitivity adjusting means responsive to said detecting means for adjusting the signal level of said received signal



when a number of said plurality of tuning points is detected.

4,919,641

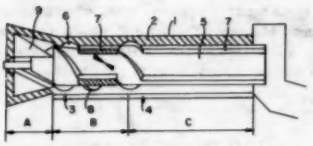
AXIAL THRESHING AND SEPARATING MEANS

Jury N. Yarmashev; Vladimir A. Zapandi; Valentin N. Tkachev, and Olev I. Peder, all of Taganrog, U.S.S.R., assignors to Spetsializirovannoe Konstruktorskoe Bjuro No Komplexam Machin Dlya Dvukhfaznoi Uborki, Taganrog, U.S.S.R.

Filed Oct. 7, 1988, Ser. No. 255,108

Int. Cl.[5] A01F *12/20*

U.S. Cl. 460—69 **5 Claims**



1. An axial threshing and separating means having receiving, threshing and separating zones and comprising:

a housing having helical guide ribs on its internal surface;

a threshing concave and separating grate arranged in a lower part of said housing;

a rotor mounted for rotation in said housing;

threshing and separating elements positioned in said threshing and separating zones and mounted on a surface of said rotor and disposed thereon in steps so that each step includes conjugated helical and straight portions;

conveying elements disposed between said threshing and separating elements at an angle relative to an axis of said rotor and spaced apart with respect to each other along the length of the rotor, each said conveying element having a forward end and a rearward end;

each of said conveying elements connected by the forward end thereof to one straight portion, and the rearward end thereof is spaced from a straight portion that follows said one straight portion with respect to the direction of rotation of said rotor.

4,919,642

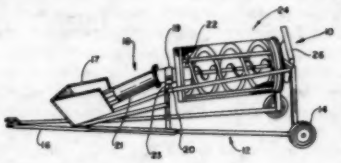
ROTARY GRAIN SCREENER

Eugene G. Sukup, Hampton; Charles E. Sukup, and Steven Sukup, both of Dougherty, all of Iowa, assignors to Sukup Manufacturing Company, Sheffield, Iowa

Filed Nov. 30, 1988, Ser. No. 278,048

Int. Cl.[5] B02S *3/06*

U.S. Cl. 460—80 **17 Claims**



1. A rotary grain screener comprising a screener drum including a cylindrical mesh screen, a plurality of axially spaced rim means supporting said mesh screen, frame means supporting said drum, drive means for rotating said drum, and a first conveying means for advancing the grain in the screener drum, a second conveying means within and disposed along a common axis with the screener drum for advancing the grain in the screener drum, said first conveying means comprising flighting adjacent to the inner peripheral surface of said screener drum, said flighting being rotatable with said drum and of a pitch to advance grain therein as the drum and flighting are rotated.

4,919,643

DEVICE FOR SETTING A GEAR RATIO IN A CONTINUALLY VARIABLE BELT-DRIVE TRANSMISSION

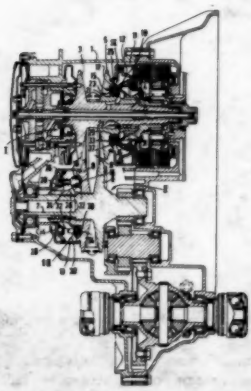
Josef Fuss, Elsdorf, and Gerd Adams, Leichlingen, both of Fed. Rep. of Germany, assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 27, 1988, Ser. No. 290,338

Claims priority, application Fed. Rep. of Germany, May 13, 1988, 3816357

Int. Cl.[5] F16H *55/56*

U.S. Cl. 474—46 **8 Claims**



1. In a continuously variable transmission adapted to produce stepless gear ratios between its input and output, a device for setting a predetermined gear ratio, comprising:

a first shaft mounted for rotation, supporting a pulley fixed to said shaft and a pulley axially displaceable thereon;

servo means, including a piston for moving the displaceable pulley with respect to the fixed pulley;

spring means for biasing the displaceable pulley toward the associated fixed pulley;

means responsive to the position of the servo means piston for preventing the spring means from moving the displaceable pulley and for releasing the spring means to move the displaceable pulley.

4,919,644

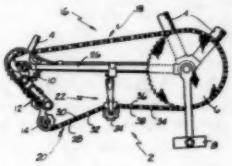
CHAIN CONTROL APPARATUS

James P. Carlyle, 3153 Ames, Denver, Colo. 80214

Filed Oct. 27, 1988, Ser. No. 263,348

Int. Cl.[5] F16H *11/08*

U.S. Cl. 474—80 **20 Claims**



1. Apparatus for use with a bicycle to control undesirable chain travel comprising:

a bicycle frame;

a plurality of gear means for rotating at least one driven wheel means at different speeds;

driving means rotatably mounted on said bicycle frame for rotating said at least one driven wheel means and having at least one gear means mounted thereon for rotation therewith;

support means mounted on said driving means so that a user may contact said support means and rotate said driving means;

at least one chain drive journaled around at least one of said plurality of gear means and said at least one gear means of said driving means so that said at least one chain drive has an upper run and a lower run;

said upper and lower runs lying generally in the same plane;

chain tensioning means for maintaining the proper tension on said chain drive;

chain control guide means for guiding said chain and having an opening extending therethrough;

mounting means for securely mounting said chain control guide means on said bicycle frame so that said lower run passes through said opening;

at least a portion of said lower run being in contact with and supported by at least a portion of said chain control guide means;

said chain control guide means providing a positive, relatively fixed support to prevent contact of said lower run with the terrain over which the bicycle is operating;

said chain control guide means dividing said lower run into a first section having upper and lower sides and having at least a portion thereof next adjacent to its contact with said chain control guide means extending generally in a linear direction and a second section having upper and lower sides and having at least a portion thereof next adjacent to its contact with said chain control guide means extending generally in a linear direction; and

said lower side of said first section meeting with said lower side of said second section to form an included angle of less than 180 degrees.

4,919,645

ENDLESS TRANSMISSION BELT

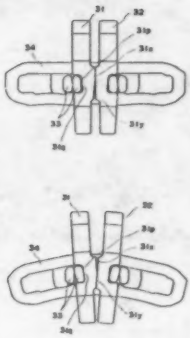
Shiro Sakakibara; Yoshinori Miyaishi, both of Aichi, and Yoshiaki Kano, Gifu, all of Japan, assignors to Aisin-Aw Kabushiki Kaisha, Japan

Filed Dec. 21, 1988, Ser. No. 287,115

Claims priority, application Japan, Dec. 29, 1987, 62-335987

Int. Cl.[5] F16G *1/24*

U.S. Cl. 474—245 **8 Claims**



1. An endless transmission belt comprising:

a plurality of sets of link plates;

a plurality of pin pairs, each pair of pins linking one end of one set of link plates to an adjacent end of another set of link plates to form the endless belt; said pins being oblong in cross-section, said pins of each pair canting by rotation against each other, about their longitudinal axes during passage around a pulley;

a plurality of blocks mounted on and extending around the circumference of the belt, each of said blocks having a pair of generally parallel surfaces transverse to said belt, at least one of said generally parallel surfaces having a pin engagement groove, said groove entrapping a pin pair in cooperation with a mating pin engagement groove of an adjacent block and said groove having a recess for accommodating the canting of said pins during travel around a pulley.

4,919,646

SYSTEM FOR AUTOMATICALLY BALANCING A CENTRIFUGE IN OPERATION

Jacques Perdriat, Maule, France, assignor to Acutronic France, Les Clayes-Sous-Bois, France

Filed Jan. 13, 1989, Ser. No. 297,060

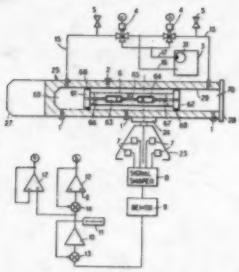
Claims priority, application France, Jan. 18, 1988, 88 00506

Int. Cl.[5] B04B *9/14*

U.S. Cl. 494—1 **13 Claims**

1. A system for automatically balancing a centrifuge in operation, the centrifuge including a rotary arm including at least one horizontal tube mounted on a turret for rotation about a vertical axis relative to a stand, the balancing system comprising a system for selectively displacing a mass of fluid inside said hollow horizontal tube, and a circuit for measuring any unbalance of the rotary arm which may be out-of-balance, and the circuit for measuring the unbalance comprising sensors disposed on the centrifuge, circuits for processing the signals delivered by the sensors in order to deliver alarm signals or rebalancing control signals in the event of unbalance being detected, and control means for controlling said system for selectively displacing a mass of fluid, said control means responding to rebalancing control signals delivered by the unbal-

ance measuring circuit in order to give rise to selective real time displacement inside said hollow horizontal tube of a mass



of fluid for dynamically rebalancing the rotating arm of the centrifuge.

4,919,647

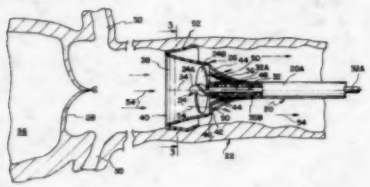
AORTICALLY LOCATED BLOOD PUMPING CATHETER AND METHOD OF USE

John Nash, Downingtown, Pa., assignor to Kensey Nash Corporation, Exton, Pa.

Filed Oct. 13, 1988, Ser. No. 257,489

Int. Cl.[5] A61M *1/03*

U.S. Cl. 600—16 **22 Claims**



1. Apparatus for disposition within the aorta of a living being to effect the pumping of blood through at least a portion of the being's vascular system, said apparatus comprising an elongated catheter having a distal end portion, said catheter being of sufficiently small diameter to enable it to be freely located within the aorta so that its distal end portion is at a predetermined position spaced away from and not in contact with the aortic valve, said apparatus comprising pump means located at said distal end portion, barrier means located at said distal end portion, and drive means coupled to said pump means for operating said pump means, whereupon blood is made to flow through said aorta, said distal end portion of said apparatus comprising an inlet in fluid communication with said aorta distally of said pump means and an outlet in fluid communication with said aorta proximally of said pump means, said barrier means comprising conformable wall means for closely engaging the inner periphery of said aorta at said predetermined position to ensure that substantially all of the blood flowing through the aorta flows into said inlet to said pump means and out said outlet from said pump means and not around the exterior of the distal end portion of said apparatus.

4,919,648

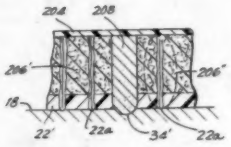
HIGH TACK DRUG PATCH

Dan Sibalis, Stony Brook, N.Y., assignor to Drug Delivery Systems Inc., New York, N.Y.

Division of Ser. No. 922,296, Oct. 23, 1986, abandoned, which is a division of Ser. No. 839,050, Mar. 12, 1986, Pat. No. 4,640,689, which is a continuation of Ser. No. 702,486, Feb. 19, 1985, abandoned, which is a continuation-in-part of Ser. No. 660,192, Oct. 12, 1984, Pat. No. 4,622,031, which is a continuation-in-part of Ser. No. 524,252, Aug. 18, 1983, Pat. No. 4,557,723. This application May 20, 1988, Ser. No. 196,663

Int. Cl.[5] A61N *1/30*

U.S. Cl. 604—20 **10 Claims**



1. A transdermal drug patch for delivering at least one drug to a patient through the skin comprising:

at least two electrodes forming said patch and separated from each other, each electrode including a conductive element;

drug reservoir means, in at least one of said electrodes;

a circuit, including a power source, for supplying power to and connected to said electrodes at such conductive elements and said reservoir means; and

adhesive means for affixing said patch to the skin, this adhesive means augmented by a plurality of isolated spots of high tack gel traversing the drug reservoir means extending from the bottom of the patch to at least one electrode above the drug reservoir means, whereby the patch is more easily removed and replaced than if the adhesive means were homogeneous, and whereby upon adherence the drug is delivered through the skin.

4,919,649

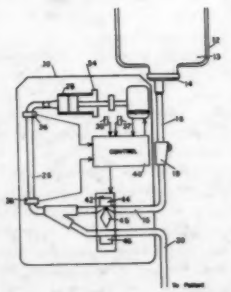
FLUID DELIVERY SYSTEM

Earle J. Timothy, Clinton; Edward W. Jackson, Northford; Joseph A. Mingrone; Jeffrey W. Jolie, both of New London; Dennis L. Nudelman, Waterford, and John F. Howard, Brookfield, all of Conn., assignors to Sherwood Medical Company, St. Louis, Mo.

Filed Sep. 30, 1987, Ser. No. 103,437

Int. Cl.[5] A61M *5/00*

U.S. Cl. 604—65 **16 Claims**



1. A delivery set for a medical fluid delivery system comprising an inlet fluid conduit for connection to a supply of fluid, a

first compressible valve section in said inlet fluid conduit, an outlet fluid conduit, a second compressible valve section in said outlet fluid conduit, a fluid column having a selected length and cross-section corresponding to an incremental fluid volume and connected at its lower end to said fluid inlet and outlet conduits, and means for varying air pressure in said fluid column, said means being connected to said fluid column, wherein said fluid supply and said fluid conduits are formed between plastic films.

4,919,650

INFUSION PUMP

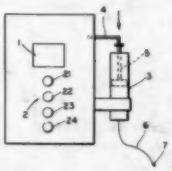
Vladimir Feingold, Cherrybrook, and Peter C. Allworth, Wollstonecraft, both of Australia, assignors to Bionica Pty. Limited, Castle Hill, Australia

Filed Mar. 29, 1988, Ser. No. 174,770

Claims priority, application Australia, Mar. 30, 1987, PI1140

Int. Cl.[5] A61M *5/00*; F04B *49/06*

U.S. Cl. 604—67 **25 Claims**



1. A method of controlling an infusion pump, said pump including a motor adapted to impart continuous rotary motion via an output shaft, said pump further including encoding means adapted to provide data indicative of rotational motion of said output shaft, said data being proportional to the angular displacement of said output shaft; said method comprising providing power to said motor only for a first period of time within a time window during which first data is produced from said encoding means; monitoring second data received from said encoding means during a second period of time immediately following said first period of time during said time window; comparing said first and second data with desired data corresponding to a predetermined volume feed rate of said infusion pump and, on the basis of said comparison, determining whether and for how long to energize said motor during subsequent window periods.

4,919,651

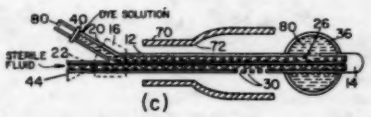
CATHETER HAVING A DOUBLE LUMEN AND A BALLOON AND METHOD OF USING THE SAME FOR CONTROLLED OPERATIVE CHOLANGIOGRAPHY

Wilton A. Doane, Santa Barbara, Calif., assignor to Santa Barbara Medical Foundation Clinic, Santa Barbara, Calif.

Continuation of Ser. No. 183,408, Apr. 15, 1988, abandoned, which is a continuation of Ser. No. 729,977, May 1, 1985, abandoned. This application Jan. 9, 1989, Ser. No. 296,360

Int. Cl.[5] A61M *29/00*

U.S. Cl. 604—96 **7 Claims**



1. A system for controllably filling a natural passageway terminating in a passageway opening in a human body with a dye fluid which is adapted to be responsive to x-rays during operative cholangiography, said system comprising

a cholangiography catheter comprising

a flexible double lumen tubing having at one end thereof a first opening extending from the interior of one lumen of the double lumen tubing to the exterior thereof and at the other end thereof a plurality of second openings located a predetermined distance from the first opening, said plurality of second openings extending from the interior of the other lumen of the double lumen tubing to the exterior thereof;

a closed, fluid tight distal tip located at said one end of the double lumen tubing;

a bifurcated connector located at said other end of the double lumen tubing, said bifurcated connector having two separate passageways therethrough so as to communicate with the two tubing members and lumens respectively;

a first elongated tubing member operatively coupled to said bifurcated connector which communicates with said one lumen and a second elongated tubing member operatively coupled to said bifurcated connector which communicates with said other lumen;

a balloon having opposed ends surrounding said one end of said double lumen tubing and enclosing said first opening;

means for securing the opposed ends of the balloon to said double lumen tubing exterior with the balloon material stretched longitudinally between said securing means over said first openings and snugly against the double lumen tubing exterior when the balloon is deflated; and

a valve having an open and closed position operatively coupled to said first elongated tubing member, said valve when in said open position enables a fluid to be transported therethrough into said first elongated member, through said first opening into expandable engagement with said balloon, said valve when actuated from said open position to said closed position occludes fluid in said one lumen and to hold said balloon at a selected expanded direction;

an inlet operatively coupled to the elongated tubing member and which enables a fluid to be passed therethrough into said other lumen, through said second openings, to the exterior of said double lumen tubing and into a natural passageway;

a removable elongated stylet positioned to extend through said second elongated tubing communicating with the second passageway through said bifurcated connector, through said second passageway and through said other lumen, said stylet having a length to enable the end thereof to extend into said other lumen to the distal tip to stiffen said flexible double catheter and render the same relatively rigid without stretching the same, said stylet being insertable into the catheter stiffening the same when the catheter is inserted into and proceeded along the common bile duct to the ampulla of vater within the human body and being removeable when the catheter is in the ampulla of vater;

a source of sterile fluid alternatively attached to said inlet to urge a sterile fluid through said second elongated tubing member and said bifurcated connector into said other lumen and through said second openings to remove any bubbles therefrom;

a source of a dye solution alternatively coupled to said valve for selectively urging a dye solution into said one lumen and through said first opening to expand said balloon to a selected expanded diameter and into said other lumen through said second openings and into the natural passageway to inflate the same; and

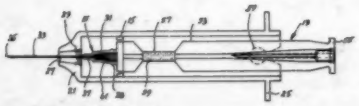
a source of x-rays for imaging the inflated natural passageway with x-rays.

4,919,652

SYRINGE

Konrad G. Alter, Maylands, and Jennifer D. Griffiths, West Lederville, both of Australia, assignors to Nujenko Pty. Ltd., Welshpool, Australia

Filed Oct. 28, 1988, Ser. No. 263,705
Int. Cl.[5] A61M 5/00
U.S. Cl. 604—110 15 Claims



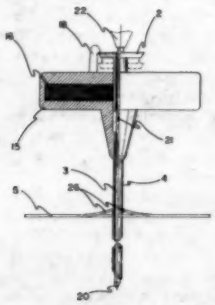
1. A syringe comprising a barrel, a plunger receivable in the barrel and movable therealong, the plunger including a shank, said shank having a selectively deformable portion for rendering said plunger inoperable, and said barrel including a side wall having an aperture opening onto an end of the barrel beyond which the shank extends, said aperture being adapted to receive said deformable portion of said shank upon lateral deflection of the outer end portion of said shank during deformation.

4,919,653

DEVICE FOR LOCATING THE EPIDURAL SPACE

Antonio E. Martinez, and Eduardo C. Garcia, both of Cea Bermudez 31 - 50B, 28001 Madrid, Spain

Filed Jul. 13, 1988, Ser. No. 219,219
Claims priority, application Spain, Jul. 28, 1987, 8702216
Int. Cl.[5] A61M 5/00
U.S. Cl. 604—117 6 Claims



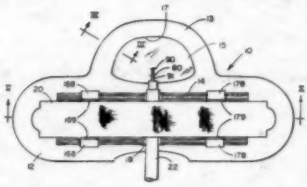
1. A device for locating the epidural space, for introducing into it anesthetics, analgesics, narcotics, and the like, by injection with a needle or a catheter, essentially characterized by comprising a canula provided with a duct therethrough and a handle inside which an electromagnet is situated and at the rear part of which there is a retaining element that also works as a stop of a sleeve axially situated in the handle, the inner surface of the sleeve being considerably corrugated; the canula further including a fixation element adjustable along the canula in order to prevent the canula from penetrating beyond the yellow ligament, thereby allowing the axial and comfortable introduction through the sleeve and the canula duct of a conically pointed needle with lateral outlet, the needle having a corrugated outer surface portion capable of being inserted into the sleeve by the electromagnet action, which is activated by a circuit operatively connected to the device capable of detecting the depression existing in the epidural space by the use of a pressure sensor operatively connected to the needle, which transforms the pressure signal into an electric signal, which is passed on to an electric circuit, so that, if there is a difference between the atmospheric pressure and the detected one, a transistorized switch will close the circuit and the above mentioned electromagnet and one or both of a sound and visual alarm will be activated.

4,919,654

IV CLAMP WITH MEMBRANE

Glenda G. Kalt, Boca Raton, Fla., assignor to Kalt Medical Corporation, Boca Raton, Fla.

Filed Aug. 3, 1988, Ser. No. 227,784
Int. Cl.[5] A61M 25/02
U.S. Cl. 604—180 19 Claims



1. A clamp for holding an IV device, comprising:
base means having an arch portion defining a window opening;
membrane means covering said window opening and having a slot therein for allowing a needle of said IV device to puncture a patient's skin at a point located under said membrane means;
flap means for covering a tube of said IV device; and
securing means for securing said flap means to said base means.

4,919,655

SINGLE USE SYRINGE

Jack B. Cline, 12827 Bromwich St., Arleta, Calif. 91331, and Stephen W. Ammerman, 619 Resolano, Pacific Palisades, Calif. 90272

Filed Jul. 19, 1988, Ser. No. 221,220
Int. Cl.[5] A61M 5/00
U.S. Cl. 604—110 16 Claims

1. A single use syringe comprising:
an elongated barrel having an internal chamber, said barrel having an outlet opening at one end and an inlet opening at the opposite end, said outlet opening being part of an outlet chamber;
a plunger movably mounted within said internal chamber, a portion of said plunger extending exteriorly of said inlet opening, said plunger terminating in an inner end defining a tip, said tip being located within said internal chamber in a snug fitting manner closing said inner end from the ambient;
a needle assembly attached to said barrel at said outlet open-

ing, said needle assembly having an interior chamber, said interior chamber being part of said outlet chamber, the improvement comprising:

a valve system mounted within said outlet chamber, said valve system including a valve body, said valve system including a passage arrangement formed within said valve body, said passage arrangement permitting flow of liquid from said internal chamber to said needle assembly only a predetermined number of times, upon said predetermined number of times having occurred said passage arrangement closes preventing flow of liquid from said internal chamber to said needle assembly; and

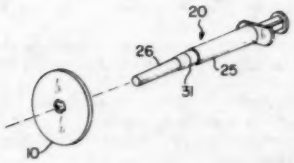
said valve system including at least one movable member, said member being movable from an open position to a closed position, said member being moved solely by liquid pressure as liquid is drawn into said internal chamber and as liquid is expelled from said internal chamber.

4,919,656

SAFETY DEVICE FOR HYPODERMIC SYRINGE TO PREVENT STICK INJURIES

Jeffrey Bracker, Rochester; Karl D. Kirk, III, and Douglas M. Spranger, both of New York, all of N.Y., assignors to BioSurge, Inc., Rochester, N.Y.

Filed Apr. 11, 1988, Ser. No. 179,947
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—192 **6 Claims**



1. For use with a hypodermic syringe of the type having a cylindrical body with a needle having a sharp point and a base supported on an extension of the body and communicating with an interior of the cylindrical body, a separate cap for said needle, said cap having a cylindrical shell and a mouth supported by said extension when the cap is engaged by the extension so that the shell portion encloses said needle, a safety device for protecting a user from accidental stick injuries on recapping said hypodermic syringe comprising:

a rigid plastic disk having a central aperture, a generally planar region surrounding said central aperture and ridge means forming an outer annular region of increased thickness,

said central aperture including a plurality of radially projecting inflexible teeth for biting into and displacing material of the shell portion of the cap as the shell portion of the cap is inserted into said aperture and said disk is forced toward the mouth portion of said cap by a user on installing said disk onto said cap,

said ridge means engaging a point of said needle in order to tend to stop motion of the needle, if on an attempt to insert the needle into the mouth portion of the cap the point of the needle is misdirected and engages that surface of the disk facing away from the users fingers.

4,919,657

DENTAL SYRINGE HAVING A MEDICATION FILLED CARPULE AND A RETRACTABLE NEEDLE CANNULA

Terry M. Haber, El Toro, and Cark B. Foster, Laguna Niguel, both of Calif., assignors to Habley Medical Technology Corporation, Laguna Hills, Calif.

Filed Nov. 14, 1988, Ser. No. 270,094
Int. Cl.[5] A61M *5/245*
U.S. Cl. 604—232 **16 Claims**

1. A syringe including a hollow syringe cylinder having an open distal end and comprising:

a fluid filled carpule;

a hollow carpule adapter having forward and rearward ends and a needle carrier located at the forward end of and movable through said adapter, said carpule adapter receiving at least some of said carpule therewithin and said needle carrier having means to engage said carpule at the forward end of said adapter, said syringe cylinder being sized so that said combination carpule and carpule adapter can be loaded therein;

a double ended needle cannula to be attached to the needle carrier of said carpule adapter such that one end of said cannula penetrates said carpule and the opposite end of said cannula projects through the open distal end of said syringe cylinder for injecting the fluid contents of said carpule; and

means for moving said carpule towards the rearward end of said carpule adapter for correspondingly relocating said needle carrier and retracting said cannula rearwardly within said carpule adapter so as to be surrounded and shielded to thereby avoid an accidental needle stick.

4,919,658

CONNECTION FOR CATHETERS, PERFUSION UNITS AND FLASKS OF LIQUID TO BE PERFUSED

Marcelo S. Badia, Barcelona, Spain, assignor to Institute Municipal D'Assistencia Sanitaria, Barcelona, Spain

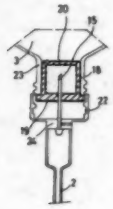
Filed Jun. 3, 1988, Ser. No. 201,756
Claims priority, application Spain, Jun. 5, 1987, 8701910[U]
Int. Cl.[5] A61M *25/00*
U.S. Cl. 604—265 **7 Claims**

1. Connection means for connecting catheter units to perfusion units or perfusion units to container units containing liquids to be perfused, especially liquids used for parenteral administration, comprising:

wall means defining a chamber containing an antimicrobial product adapted to be connected between two of said units, i.e. between the outlet of the container and a perfusion unit or between the latter and the inlet of a catheter,

said wall means having opposed portions sealingly penetrable by a hollow needle, said wall means being attached to one of said two units with one of said wall portions being exposed to the interior of said one unit;

rigid coupling means detachably connectable to said wall means and extending over the other of said wall portions, said coupling means being adapted to be connected to the other of said two units; and



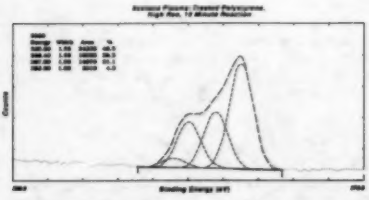
means defining a flow path through said coupling means for flow of liquid between said two units, said path including a hollow needle having its base secured to said coupling means, the length of said needle being greater than the distance between the outer sides of said opposed wall portions, and said needle being positioned to penetrate both of said wall portions when said coupling means is connected to said wall means.

4,919,659

RADIO FREQUENCY PLASMA DEPOSITED POLYMERS THAT ENHANCE CELL GROWTH

Thomas A. Horbett; Buddy D. Ratner; Joseph A. Chinn, all of Seattle, Wash., and Yasmeen Haque, Pasadena, Calif., assignors to The Board of Regents for the University of Washington, Seattle, Wash.

Continuation of Ser. No. 809,927, Dec. 16, 1985, abandoned.
This application Dec. 21, 1987, Ser. No. 136,457
Int. Cl.[5] A61F *2/06*
U.S. Cl. 623—1 **15 Claims**



11. A biological implant article that promotes endothelial cell growth and heparin binding, said article consisting essentially of:

a porous polymer material selected from the group consisting of polyester, tetrafluoroethylene and polyurethane; and

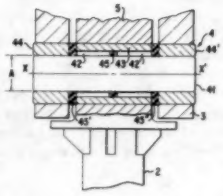
an overcoated surface layer covalently bound to said porous polymer material and comprising a plasma gas discharge layer of gas polymer selected from the group consisting of acetone, methanol, ethylene oxide, gluteraldehyde and mixtures thereof.

4,919,660

PROSTHETIC KNEE JOINT WITH ROLLER BEARINGS

Fernand Peilloud, Alby-Cheran, France, assignor to S. N. R. Roulementsi, France

Filed Oct. 13, 1987, Ser. No. 106,862
Claims priority, application France, Oct. 14, 1986, 86 14251
Int. Cl.[5] A61F *2/38, 2/30*
U.S. Cl. 623—20 **12 Claims**



1. A prosthetic knee joint comprising:

(a) a first element sized and shaped to be fastened in the medullary canal of tibia;

(b) a second element sized and shaped to be fastened in the medullary canal of a femur;

(c) a clevis having two spaced legs carried by one of said first and second elements;

(d) an eye carried by the other one of said first and second elements and received by the two spaced legs of said clevis; and

(e) a pivot shaft projecting through said eye and received in the two spaced legs of said clevis, said pivot shaft comprising:

(i) a ring mounted in said eye;

(ii) at least one rolling body mounted in said ring;

(iii) a lateral stop received in a bore in each one of the two spaced legs of said clevis;

(iv) a pin received in said at least one rolling body so as to roll without sliding therein and in each one of said lateral stops; and

(v) two separation washers mounted on said pin, one of said two separation washers being located between and in axial engagement with each end of said ring and the adjacent one of said lateral stops.

4,919,661

AUTOGENEOUS PUMPING CHAMBER AND PROCEDURES THEREFOR

John Gibney, 6236 E. Montecito, Scottsdale, Ariz. 85251

Filed Jul. 9, 1987, Ser. No. 71,422
Int. Cl.[5] A61F *2/22*
U.S. Cl. 623—3 **10 Claims**

1. The method of producing an autogeneous pumping chamber having a preselected volume within a host comprising the steps of opening the abdomen of a host and locating therein a major muscle or muscle group selected from the group consist-

ing of rectus abdominus, latissimus dorsi, pectoralis major, the quadricep, and the diaphragm; wrapping said muscle or said muscle group about a pouch-shaped implant formed of a pharmacologically acceptable plastic and having body portion and a fill port defined therein in communication with the interior of said body portion; partially filling said interior of said body portion with isotonic saline; thereafter periodically injecting additional isotonic saline into said interior of said body portion until said preselected volume is obtained; waiting for an additional period of time while said body portion is filled to its preselected volume until said muscle or muscle group forms an integral liquid-tight scar chamber thereabout; withdrawing said saline from within said implant; and withdrawing said pouch-shaped implant from within said scar chamber.

4,919,662

HYDROGEL IMPLANT LENS CONSTRUCTION RECONFIGURED DEHYDRATED RE-HYDRATED IN SITU

Randall L. Knoll, Stillwater; Wilhelm Lewon, St. Paul, and Ronald Ofstead, Maplewood, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 16, 1988, Ser. No. 245,407

Int. Cl.[5] A61F *2/16*

U.S. Cl. 623—6 **10 Claims**

1. A method of preparing an artificial intraocular lens for implantation within the eye comprising the steps of:

(a) providing an intraocular lens which consists of an optic and at least one haptic, both made of the same hydrogel material which material Las prescribed shape, dimension and physical characteristics such that it can be

(i) folded, stretched, rolled, compressed or otherwise reconfigured to a configuration such that the profile of the lens is reduced in at least one dimension,

(ii) dehydrated so that the lens will substantially retain the configuration which provides the reduced profile,

(iii) inserted through a relatively small incision made in the ocular tissue, and

(iv) allowed to rehydrate by the natural fluid present in the eye and expand to provide an optically correct lens, wherein the haptic is oriented radially outward in a conventional haptic position;

(b) applying force to the haptic or haptics radially inward so that the haptics are reconfigured to a position in front of or in back of the optic of the lens; and

(c) dehydrating the lens sufficiently so that the haptic or haptics substantially retain their position.

4,919,663

LAMINATED ZONE OF FOCUS ARTIFICIAL HYDROGEL LENS

Dennis T. Grendahl, 2070 Shoreline Dr., Orono, Minn. 55391

Continuation-in-part of Ser. No. 88,428, Aug. 24, 1987, Pat. No. 4,798,609. This application Oct. 17, 1988, Ser. No. 258,028

The portion of the term of this patent subsequent to Jan. 17, 2006, has been disclaimed.

Int. Cl.[5] A61F *2/16*

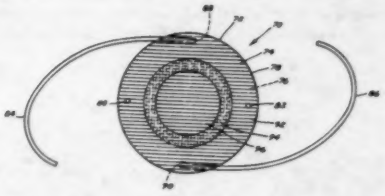
U.S. Cl. 623—6 **8 Claims**

1. A laminated zone of focus hydrogel lens for use with an eye comprising:

a. a first lamination hydrogel element encompassing a first area of said lens;

b. a second lamination hydrogel element encompassing a second area of said lens;

c. said first lamination element, in combination with said second lamination element serving to create an image of a first distinct portion of the retina; and,



d. said second lamination element serving to simultaneously create an image on a second distinct portion of the retina which is, different from said first portion; wherein

e. at least two of said laminated elements are of different colors.

4,919,664

STIMULATION OF HAIR GROWTH

Roy F. Oliver, and Colin A. B. Jahoda, both of Department of Biological Sciences University of Dundee, Dundee, Great Britain (DD1)

Filed Feb. 19, 1987, Ser. No. 16,224

Claims priority, application United Kingdom, Feb. 21, 1986, 8604360

Int. Cl.[5] A61F *2/10*

U.S. Cl. 623—15 **14 Claims**

1. A method of inducing hair follicle development and hair growth of a desired hair type in part of the skin of a mammal said skin having an outer epidermis layer and an inner dermis layer, which method comprises the steps of: selecting at least one lower follicular dermal cell to provide selected dermal cell, culturing the selected dermal cell so as to produce cultured dermal cells; forming an opening in the outer epidermis layer of said part of the mammal; and introducing cultured dermal cells through said opening in the epidermis layer into contact with the dermis layer in proximity to the epidermis and with at least some of said cultured dermal cells in contact with epidermal cells.

4,919,665

IMPLANTATION OF ARTICULATING JOINT PROSTHESIS

Charles A. Homsy, 11526 Raintree Cir., Houston, Tex. 77024

Continuation of Ser. No. 815,394, Dec. 31, 1985, Pat. No. 4,851,004, which is a continuation of Ser. No. 476,117, Mar. 17, 1983, abandoned, which is a continuation-in-part of Ser. No. 369,731, Apr. 19, 1982, abandoned. This application Jan. 23, 1989, Ser. No. 300,029

Int. Cl.[5] A61F *2/30*

U.S. Cl. 623—18 **5 Claims**

1. An intramedullary prosthesis device comprising:

a tapered elongate stem having distal and proximal ends and adapted to be forcibly inserted within an elongated stem socket having its inner periphery defined by compact bone formed by cortical bone or dense cancellous bone of a long bone in a human body, said stem having transverse sectional dimensions along substantially its entire length adapted to be undersized with respect to corresponding transverse sectional dimensions of said socket;

a layer of soft, resilient, fibrous tissue-ingrowthpromoting porous coating material of around two millimeters in

thickness surrounding the undersized stem over its entire length including said distal and proximal ends, said coating material having a relatively low modulus of elasticity generally similar to the modulus of elasticity of fibrous tissue;

said layer of resilient porous coating material being of a generally uniform thickness along the entire length of the stem sufficient to provide improved load transfer between the stem and the adjacent compact bone formed by hard cancellous bone and hard cortical bone, said tapered stem being of minimal cross-sectional area adjacent said distal

end and of maximum cross-sectional area adjacent said proximal end with said generally uniform thickness coating material progressively increasing in cross-sectional area from said distal end to said proximal end of said stem, the thickness of said coating material relative to the diameter of said stem adjacent said distal end of said stem being of a maximum of around 25% of said diameter, the thickness of said coating material relative to the minimum cross sectional dimension of the stem adjacent said proximal end being of a maximum of around 25% of said minimum cross sectional dimension.

4,919,666

IMPLANT HAVING RECESSES FOR THERAPEUTICALLY EFFECTIVE SUBSTANCES

Ursula Bachhorn, and Hans B. Willert, both of Göttingen, Fed. Rep. of Germany, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Continuation of Ser. No. 40,929, Apr. 21, 1987, abandoned. This application Dec. 14, 1988, Ser. No. 284,094

Claims priority, application Switzerland, May 5, 1986, 01834/86

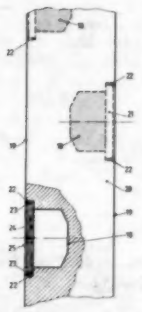
Int. Cl.[5] A61F 2/28, 5/04

U.S. Cl. 623—16 **14 Claims**

1. A bone implant for insertion into a bone cavity comprising

a body configured for implanting into a bone cavity and having at least one recess in a surface thereof, said recess being sized to receive a therapeutically effective substance for subsequent release into surrounding tissue in said cavity; and

a separate porous cover separately secured in said body from the therapeutically effective substance to close over said recess, said cover having a porosity sufficient to be permeable to the substance received in said recess and to fluids



having the substance dissolved therein while being impermeable to the ingrowth of bone tissue.

4,919,667

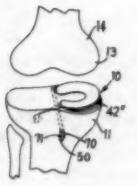
IMPLANT

James W. Richmond, Kalamazoo, Mich., assignor to Stryker Corporation, Kalamazoo, Mich.

Filed Dec. 2, 1988, Ser. No. 279,558

Int. Cl.[5] A61F 2/30

U.S. Cl. 623—18 **10 Claims**



1. A soft tissue implant in the form of meniscus cartilage replacement for a patient, comprising:

a woven cloth bottom layer;

at least one felt intermediate layer lying atop said bottom layer;

a woven cloth top layer lying atop said at least one felt layer;

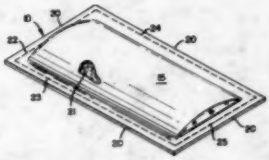
at least one coating of a resilient bonding material coating said layers, said bonding material being interposed between said layers and fixing same together to form a laminated body, said layers being generally C-shaped in plan, so as to have a concave perimeter edge and an oppositely facing convex perimeter edge spaced across the width of said generally C-shaped body, the convex perimeter edge defining the ends of the generally C-shaped body, said at least one felt intermediate layer having a width less than that of said woven top and bottom layers, and therewith having its concave perimeter edge and ends retracted inboard of the corresponding concave perimeter edge and ends of said woven top and bottom layers, and therewith making the body taper in central cross-section from a thin concave perimeter edge to a much thicker convex perimeter edge, said convex perimeter edge tapering to reduce its thickness toward said ends, said body thus having a generally wedge shaped central cross-section, said woven top layer thereby being distorted to a three dimensional generally bowl shape.

4,919,668

TEMPOROMANDIBULAR JOINT DISC IMPLANT

Robert S. Rosenbaum, 69 Grayfield Ave., West Roxbury, Mass. 02132, and Noshir R. Menta, 50 Maugus Hill Rd., Wellesley, Mass. 02181

Filed Aug. 8, 1988, Ser. No. 229,243
Int. Cl.[5] A61F 2/30, 2/12
U.S. Cl. 623—18 9 Claims



1. A prosthetic temporomandibular (TM) joint disc comprising an envelope composed of a compressible biocompatible material and being sized to be positioned within the joint

said envelope having a first surface adapted to engage the articular surface of the temporal bone and a second surface adapted to contact the mandibular condyle

said envelope enclosing a fluid-filled medium containing a liquid-filling solution, with at least a portion of said liquid-filling solution being introduced or withdrawn from said envelope to adjust the size of said joint disc upon surgically implanting said joint disc

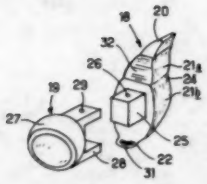
said envelope further having at least one flap extending from said envelope composed of expanded polytetrafluoroethylene, with said flap adapted to be sutured in situ solely to soft tissue to secure said envelope within said joint.

4,919,669

SHOULDER PROSTHESIS

Jean Lannelongue, 2, rue Ferdinand Dubreuil, 37000 Tours, France

Filed Feb. 8, 1988, Ser. No. 153,384
Claims priority, application France, Feb. 9, 1987, 87 01524
Int. Cl.[5] A61F 2/40, 2/30
U.S. Cl. 623—19 18 Claims



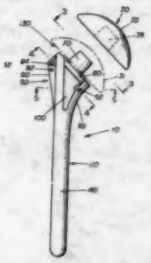
1. A shoulder prosthesis, comprising a humeral piece (7) intended to be fixed in a humerus (1) to replace at least the head thereof and comprising a hollow tubular element (9) which must be fixed in the humerus (1) substantially along the longitudinal axis thereof and a cylindrical rod (10), the upper end of which carries a ball (16) cooperating with a glenoid bearing surface to form a shoulder joint and the lower end of which is disposed in said tubular element (9), this and the rod (10) being able to slide relative to each other, the glenoid bearing surface consisting of a glenoid piece (8) which comprises an anchoring element intended to be inserted into a cavity formed in the scapula (2) and a female hemispherical element (19), this latter cooperating with the male ball (16) of the humeral piece (7), wherein the anchoring element (18) contains, on the one hand, in its upper part, a stabilizer (20) intended to be introduced into the base of the coracoid process (4) of the scapula (2) and, on the other hand, in its lower part, an orifice (22) for the passage of a fixation means (23) into the spine of the scapula (2), and wherein the cylindrical rod (10) has a straight cross section substantially equal to that of the housing (11) which constitutes the hollow in the interior of the tubular element (9), said anchoring element (18) further comprising a solid member (21), having an upper part (21a) and a lower part (21b), the horizontal cross sections of which are substantially isosceles triangles.

4,919,670

MODULAR HUMERAL PROSTHESIS

James L. Dale, Austin; Brain D. Burkinshaw, Pflugerville, and Wayne Z. Burkhead, Dallas, all of Tex., assignors to Intermedics Orthopedics, Inc., Austin, Tex.

Filed Feb. 3, 1988, Ser. No. 151,896
Int. Cl.[5] A61F 2/40
U.S. Cl. 623—19 21 Claims



16. A modular humeral prosthetic device comprising:

a humeral stem having a substantially cylindrical distal end and a widened proximal end;

the proximal end having a proximal end surface which is angled relative to the axis of the distal end;

a male taperlock means protruding from the center of the proximal end surface;

a head means having a substantially spherically shaped outer surface for engagement within the glenoid cavity of a human scapula, the head means including a central female taperlock means for receiving and engaging the male taperlock means in a rigid mechanical coupling engagement;

the outer surface of the spherically shaped head means comprising less than half the surface of a complete sphere, the theoretical center of the spherically shaped head means being disposed at or below the proximal end surface when the male and female taperlocks are lockably engaged.

4,919,671

METAL ANCHORING PART FOR A KNEE JOINT ENDOPROSTHESIS

Kurt Karpf, Holderbank, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Apr. 13, 1988, Ser. No. 181,079
Claims priority, application Switzerland, May 15, 1987, 1888/87
Int. Cl.[5] A61F 2/38
U.S. Cl. 623—20 12 Claims

1. A metal anchoring part for a knee joint endoprosthesis having a tibia bearing surface on one side, a tibial plateau on an

opposite side from said bearing surface and disposed on an inclined plane and hollow anchoring rails extending from said

plateau in a ventral to dorsal direction to permit sliding in said direction relative to a prepared recess in a tibia.

4,919,672

HIP JOINT AUGMENTATION

Edward A. Millar, Box 30, St. Mary's Rd., Libertyville, Ill. 60048; Gerald F. Harris, 3107 S. 122nd St., #7, West Allis, Wis. 53227, and Roy G. Fink, 1320 Badgley Rd., Jackson, Mich. 49203

Filed Jan. 23, 1989, Ser. No. 300,041

Int. Cl.[5] A61F *2/34, 2/30*

U.S. Cl. 623—22 **5 Claims**

1. An extracapsular prosthesis designed to serve as an adjunct to an existing natural socket comprising:

a curvilinear shell configured to extend laterally, posteriorly and superiorly beyond the acetabulum including an elongated base having a concave inner surface and an outer surface, a flange extending substantially along the outer surface and outwardly from said base to overlap the natural ilium, said flange adapted to receive means for attaching the shell to the ilium exterior adjacent to the natural socket, a lip extending from said base opposite said flange, said lip having an inner concave surface extending posteriorly and superiorly beyond the acetabular rim wherein the combination of said lip and said base form a substantially continuous concave inner surface which is complimentary to the surface configuration of the natural socket thereby defining an extracapsular extension to retain the femoral head within the natural socket.

4,919,673

PROSTHESIS FOR A FEMORAL HEAD

Hans-Georg Willert, Gottingen, Fed. Rep. of Germany, and Manfred Semlitsch, Winterthur, Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Feb. 24, 1989, Ser. No. 315,731

Claims priority, application Switzerland, Feb. 29, 1988, 00746/88

Int. Cl.[5] A61F *2/36*

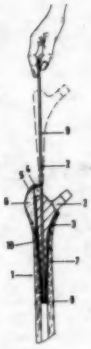
U.S. Cl. 623—23 **4 Claims**

1. In combination

a centering rod for disposition in a bone cavity of a femur;

a bond marrow cavity barrier detachably secured to a distal end of said rod; and

a prosthesis for a femoral head having a longitudinally ex-



tending stem having a bore extending along a longitudinal axis of said stem, said bore having a diameter for slidably receiving said rod therein to guide said stem into the bone cavity.

4,919,674

HIP CUP FOR A HIP JOINT ACETABULAR PROSTHESIS

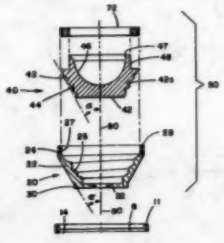
Klaus-Dieter Schelhas, Bremen, Fed. Rep. of Germany, assignor to Orthoplant Endoprothetick GmbH, Bremen, Fed. Rep. of Germany

Filed Jan. 19, 1988, Ser. No. 145,289

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1987, 3701381

Int. Cl.[5] A61F *2/34*

U.S. Cl. 623—22 **10 Claims**



1. An acetabular prosthesis comprising an outer metallic shell having an outer bone engaging surface and a conically shaped inner surface defining shell cavity;

an insert including, in combination, a metallic jacket, a plastic liner and a threaded ring;

said jacket having an outer surface configured to engage said shell cavity and an inner jacket surface forming a jacket cavity defining a crown end and an opposite open end, and wherein the inner jacket, at a peripheral edge adjacent the open end, has internal threads to mate with aid threaded ring; and

said plastic liner having a part spherical inner liner surface adapted to engage an articulating joint element and an outer liner surface configured to be pressure clamped within the jacket cavity and locked therein upon securing the threaded ring to the internal threads of the jacket, and

wherein the insert, in combination, is then fixedly secured within the metallic shell by a retaining means.

4,919,675

HEMISPHERICAL PROSTHETIC ACETABULUM

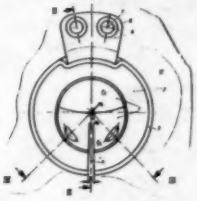
Carlo Dietschi, Lugano, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Feb. 23, 1989, Ser. No. 315,560

Claims priority, application Switzerland, Feb. 26, 1988, 718/88

Int. Cl.[5] A61F 2/34

U.S. Cl. 623—22 12 Claims



1. A hemispherical prosthetic acetabulum comprising

a metal shell structure of hemispherical shape having a meridian-disposed elongated slot extending from a equatorial edge thereof and a fixing tab extending therefrom diametrically opposite said slot for affixation to a pelvic bone; and

a plastic cup disposed in said shell structure, said cup having a meridian-disposed elongated slot coinciding with said slot in said shell structure and defining a cavity for receiving a femoral head, said cavity having a first spherical surface area of a first radius corresponding to a radius of a femoral head with a first center disposed on an equatorial plane of said cup and a second spherical surface area of a second radius larger than said first radius with a second center disposed on said equatorial plane of said cup, said second center being displaced from said first center in a direction toward said slot in said cup.

4,919,676

METAL SHELL FOR AN ARTIFICIAL HIP JOINT SOCKET

K. Zweymuller, Vienna, Austria, and Rudolf Koch, Berlingen, Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jun. 15, 1988, Ser. No. 207,290

Claims priority, application Switzerland, Jun. 25, 1987, 2398/87

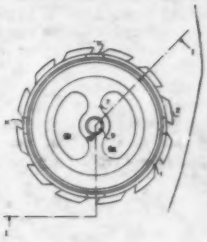
Int. Cl.[5] A61F 2/34

U.S. Cl. 623—22 6 Claims

1. An outer metal shell for an artificial hip joint socket, said shell comprising

a peripheral wall defining a cavity for receiving a plastic socket element and having an opening in an apical region and a self-cutting thread on an exterior surface of said wall; and

bridging means extending across said apical region to subdivide said opening into a plurality of subopenings to permit the introduction and compaction of bone material into a surgically produced recess in a pelvic bone, said means



including a centrally disposed threaded bore for threadably receiving an insertion instrument.

4,919,677

PROSTHETIC ACETABULUM

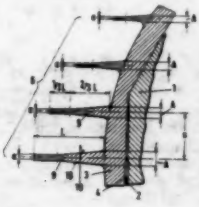
Karl-Gerhart Stubmer, Ravensburg, Fed. Rep. of Germany; Rudolf Koch, Berlingen, and Otto Frey, Winterthur, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Aug. 11, 1989, Ser. No. 392,709

Claims priority, application Switzerland, Aug. 25, 1988, 3168/88

Int. Cl.[5] A61F 2/32

U.S. Cl. 623—22 10 Claims



6. A one-piece metal hemispherical shell for an acetabulum, said shell having a constant-pitch self-tapping screwthread on an outer peripheral surface, said thread having a cross-sectional shape of constant thickness from a free end over a portion of the cross-sectional length thereof and an increasing thickness towards said surface over the remainder thereof.

4,919,678

HIP JOINT PROSTHESIS HAVING A CYLINDRICAL SHAFT PORTION

Curt Kranz, Berlin, Fed. Rep. of Germany, assignor to MECRON medizinische Produkte GmbH, Berlin, Fed. Rep. of Germany

Filed Jun. 13, 1988, Ser. No. 205,883

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1987, 8708500[U]

Int. Cl.[5] A61F 2/32

U.S. Cl. 623—23 15 Claims

1. A hip joint prosthesis, comprising:

a first member having a shaft portion having a longitudinal axis, said first member having a lateral arm extending at an angle relative to said longitudinal axis, said lateral arm having a terminal end adapted for receiving a joint ball, wherein in a region adjacent said shaft portion said lateral arm has a length in a direction parallel to said longitudinal axis and a width in a direction tangential to said shaft

portion, said length being substantially larger than said width;

a second member having a substantially tubular body which has a proximal end having a hollow interior, said proximal end of said second member having a generally longitudinally disposed slit therein, said slit portion being relatively narrow in width relative to a peripheral circumferential extent of said substantially tubular body adjacent said slit, said hollow interior of said proximal end of said second member being adapted for receiving said shaft portion of said first member such that said lateral arm projects through said slit in said second member;

in an assembled condition, said shaft portion of said first member being substantially completely disposed within said hollow interior of said proximal end of said second member and being substantially completely surrounded by said tubular body, and said region of said lateral arm adjacent said shaft portion being disposed in said slit; and

connecting means for fixedly connecting a proximal end of said shaft portion to a proximal end of said second member while said first and second members are in said assembled condition.

4,919,679

FEMORAL STEM SURGICAL INSTRUMENT SYSTEM

Robert G. Averill, Ringwood; Alfred J. Zarnowski, North Plainfield, and Matthew V. Lyons, Hoboken, all of N.J., assignors to Osteonics Corp., Allendale, N.J.

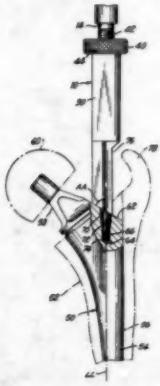
Filed Jan. 31, 1989, Ser. No. 304,782

Int. Cl.[5] **A61F** *2/36;* **A61B** *17/00, 17/18*

U.S. Cl. 623—23 **15 Claims**

9. The improvement in a femoral stem surgical instrument system for use in connection with manipulating, impacting and extracting a femoral stem during procedures involving the placement of the femoral stem relative to a femur, the femoral stem extending in an axial direction and including a proximal surface transverse to the longitudinal direction and making an acute angle with the longitudinal direction, and a recess extending in the axial direction from the proximal surface distally into the femoral stem, the femoral stem surgical instrument system including a handle component having a coupling projection for selective engagement with the recess to couple the handle component with the femoral stem for manipulation of the femoral stem in direct response to manipulation of the handle component, the improvement comprising:

a bore portion extending in an axial direction along the recess, the bore portion being spaced distally from the proximal surface and including a first coupling configuration therein;



the coupling projection including a second coupling configuration complementary t the first coupling configuration;

the handle component including a coupling sleeve carried by the handle component for relative movement between the coupling sleeve and the coupling projection in axial directions, a coupling surface on the coupling sleeve, the coupling surface making an acute angle with the axial direction for matching the acute angle of the proximal surface so as to enable selective coupling of the coupling surface with the proximal surface, and locking means on the handle component for locking the coupling sleeve against axial movement relative to the proximal surface of the femoral stem when the first and second coupling configurations are coupled together and the coupling surface is in engagement with the proximal surface of the femoral stem.

4,919,680

HIGH-EXTRACTION CHROME TANNING PROCESS

Bernhard Wehling; Bernd Makowka, both of Bergisch-Gladbach; Heinz-Günter Klein, deceased, late of Bergisch-Gladbach; Gertrud Klein, heir, Cologne, and Helga Rosentreter, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 11, 1988, Ser. No. 231,233

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1987, 3726796

Int. Cl.[5] C14C 3/06

U.S. Cl. 8—94.27 6 Claims

1. In an improved process for the chrome tanning of pickled hides with a tanning agent comprising a reaction product of a basic chromium (III) sulfate and aliphatic C_4–C_6 dicarboxylic acids or salts thereof,

the improvement comprises preparing said reaction product in an aqueous solution from basic chromium (III) sulfate and 0.2 to 0.8 mol of the aliphatic dicarboxylic acids per mol chromium oxide of the basic chromium sulfate to 50° to 100° C. over a period of 30 to 180 minutes with subsequent adjustment of the theoretical basicity to 0 to 50% with alkali metal hydroxide or carbonate,

the reaction product being added to a hide pickling liquor in the form of an aqueous solution having a chromium oxide content of at least 5% or in powder form in a quantity of 0.9 to 1.5% chromium oxide, based on hide weight, the liquor volume comprising less than 100%, based on hide weight, the final pH value being above 4.0 and the final temperature above 40° C.

4,919,681

METHOD OF PREPARING CELLULOSIC FIBERS HAVING INCREASED ABSORBENCY

Robert A. Tyler, Candler; Henry C. Ramsey, and Robert N. Armstrong, both of Asheville, all of N.C., assignors to BASF Corporation, Williamsburg, Va.

Filed Feb. 16, 1988, Ser. No. 156,391

Int. Cl.[5] D06M 1/00; B32B 23/04

U.S. Cl. 8—116.1 22 Claims

1. A method of increasing the absorbency of cellulosic fibers comprising:

contacting said cellulosic fibers with an aqueous acidic solution having a pH value of no more than 4;

and thereafter treating the cellulosic fibers with water for about ten seconds to about five minutes; whereby the resulting cellulosic fibers consist essentially of cellulose.

4,919,682

METAL CLAMP FOR JOINING PIPES

Emilio Bellazzi, Milan, Italy, assignor to Arcelli & Bernacchi Srl., Milan, Italy

Filed May 25, 1989, Ser. No. 356,919

Claims priority, application Italy, May 26, 1988, 20739 A/88

Int. Cl.[5] B65D 63/02

U.S. Cl. 24—20 R 2 Claims

1. A metal clamp for joining radially inner and outer axially aligned conduits wherein the outer conduit is made from a deformable material comprising:

an elongate base strap having two ends with one end formed as a hook having a surface facing the other end of said strap and overlapping the other end of said strap to provide a substantially cylindrical shaped metal clamp,

a non-radial bend folded in said base strap adjacent said other end and providing a surface extending outwardly at an angle diverging away from said one overlapping end,

a second bend folded in said base strap adjacent said one end of said base strap,

a straight section of said base strap between said hook and said second bend,

at least two wave-shaped bends in said base strap adjacent said second bend, and

a central lengthwise slit traversing said wave-shaped bends, whereby said one end of said base strap is movable relative to said other end to engage said hook and said non-radial bend with said surface of said hook opposed to and substantially co-planar with said surface of said non-radial bend and said straight section of said base strip extending substantially tangential relative to said metal clamp.

4,919,683

STABLE MIDDLE DISTILLATE FUEL-OIL COMPOSITIONS

Theodore E. Nalesnik, Beacon, and Sheldon Herbstman, New City, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 22, 1988, Ser. No. 288,201

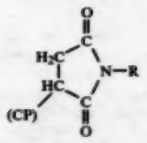
Int. Cl.[5] C10L 1/72

U.S. Cl. 44—62 5 Claims

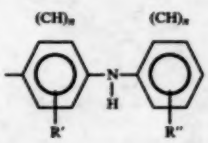
1. A stable middle distillate fuel-oil composition comprising:

(a) a major portion of a middle distillate fuel-oil; and

(b) a minor amount of, as a storage stabilizing additive, copolymer having grafted thereon an aromatic polyamine succinimide of the formula



wherein (CP) is a copolymer of ethylene and a (C_1–C_{18}) alpha-monoolefin and R is



where R', R" are each aryl, alkylryl, HN-Aryl, alkoxyl or H and n=0 or 6.

4,919,684

STABLE MIDDLE DISTILLATE FUEL-OIL COMPOSITIONS

Theodore E. Nalesnik, Beacon, and Sheldon Herbstman, New City, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 22, 1988, Ser. No. 288,206

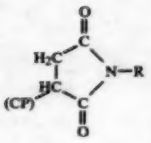
Int. Cl.[5] C10L 1/22

U.S. Cl. 44—62 5 Claims

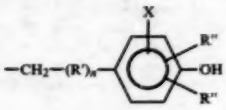
1. A stable middle distillate fuel-oil composition comprising:

(a) a major portion of a middle distillate fuel-oil; and

(b) a minor amount of, as a storage stabilizing additive, a hydroxy aromatic or alkyl phenol succinimide of grafted onto a copolymer of the formula



where (CP) is a copolymer of ethylene and a (C_3–C_{18}) alpha monoolefin, and R is



wherein R' is an alkyl, alkoxyl, alkylaryl or aryl group; X is a hydroxy aromatic amine SH, OH, OR, or H; and R'' is H, alkyl, an alkoxyl or an aryl group and n=0–6.

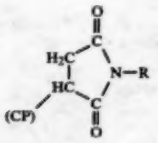
4,919,685

STABLE MIDDLE DISTILLATE FUEL-OIL COMPOSITIONS

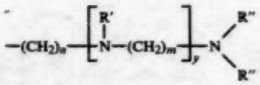
Sheldon Herbstman, New City, and Theodore E. Nalesnik, Wappingers Falls, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 22, 1988, Ser. No. 288,209
Int. Cl.[5] C10L 1/22
U.S. Cl. 44—62 **6 Claims**

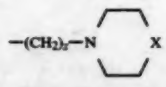
1. A stable middle distillate fuel-oil composition comprising:
(a) a major portion of a middle distillate fuel-oil; and
(b) a minor amount of, as a storage stabilizing additive, an aliphatic succinimide and/or aliphatic polyamine succinimide of a copolymer of the formula



wherein (CP) is copolymer of ethylene and a (C_3–C_{18}) alpha monoolefin, R is an aryl group, a (C_3–C_{18}) alkyl group, a (C_2–C_{10}) alkenyl group, or an alkyl polytertiary amine including



wherein R' and R'' are each an alkyl, alkenyl or aryl group, n=1–4, m=1–4 and y=1–4 or



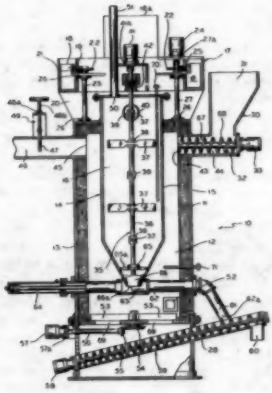
wherein X is O, S or N-R' and z=1–6.

4,919,686

PROCESS FOR THE PYROLYTIC PRODUCTION OF SYNTHETIC GAS

Raymond S. Edwards, Scottsdale, Ariz., assignor to Co-Gen Power Corporation, Phoenix, Ariz.

Continuation-in-part of Ser. No. 918,310, Oct. 14, 1986, abandoned. This application Sep. 30, 1987, Ser. No. 102,838
Int. Cl.[5] C10J 3/00
U.S. Cl. 48—197 R **52 Claims**



1. A method for the pyrolytic production of synthetic gas from components of solid, light unit density materials of less than 30 lb/ft^3 and high unit density materials of more than 30 lb/ft^3, including selected segregated postconsumed waste materials, within a pyrolytic gasifier operably heated by an associated furnace, said method comprising the steps of:
preparing said materials for use as pyrolytically decomposable gasifier fuel by physically fragmenting same through material preparation means;
conveying said materials from said material preparation means to material segregation means by material conveying means operably associated therebetween;
segregating said materials into separately and physically distinct homogenous ones of stored segregated components of said gasifier fuel by said material segregation means;
delivering from said material segregation means said components of gasifier fuel formulation into a desired gasifier fuel component ratio by gasifier fuel delivery means to compacting means, as a formulated gasifier fuel mixture;
compacting said gasifier fuel mixture by said compacting means operably connected to said gasifier fuel delivery means, so as to substantially eliminate entrapped oxygen and nitrogen within said gasifier fuel mixture and to prevent the potential for oxygenated combustion thereof;
heating the interior of said gasifier means by furnace means operably positioned adjacent said gasifier means for, in turn, heating said gasified fuel mixture to a desired temperature of between 700 degrees Fahrenheit and 900 degrees Fahrenheit;
transporting said gasifier fuel mixture from said compacting means to gasifier fed means by said material conveying means operably associated therewith;
feeding said desired ratio of densified gasifier fuel formula mixture into said gasifier means at a minimum unit density of 60 lb/ft^3;
directing said gasifier fuel mixture within said gasifier means towards the exterior periphery of said gasifier means to facilitate the formation of said synthetic gas through the pyrolytic decomposition of said gasifier fuel formula mixture therewith; and

collecting said synthetic gas formed within said gasifier means by said pyrolytic decomposition of said gasifier fuel formula mixture by gas collection means operably associated with said gasifier means, said gas collection means channeling said gas component to gas collection means.

4,919,687

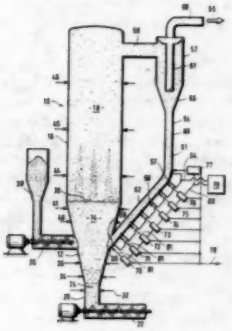
APPARATUS FOR THE PRODUCTION OF GAS CONTAINING HYDROGEN AND CARBON MONOXIDE FROM SOLID FUEL

Johannes Lambertz, Kerpen; Wolfgang H. Adlhoch, Swistal; Alfred G. Mittelstädt, Hürtz-Berrenrath, and Wolfgang Hermann, Erftstadt-Gymnich, all of Fed. Rep. of Germany, assignors to Rheinische Braunkohlenwerke A.G., Cologne, Fed. Rep. of Germany

Division of Ser. No. 53,447, May 22, 1987, Pat. No. 4,852,994. This application May 17, 1989, Ser. No. 353,132

Int. Cl.[5] C10J *3/56*

U.S. Cl. 48—62 R **4 Claims**



1. Apparatus for the production of a gas containing hydrogen and carbon monoxide from a solid fuel material comprising:

(a) a gasification reactor constructed to operate under an elevated internal pressure and providing a fluidized bed portion for accommodating a fluidized bed of said solid fuel material and a post-reaction chamber above said fluidized bed portion for post-gasification reaction of material leaving said fluidized bed portion of said reactor;

(b) means for introducing said solid fuel material into said reactor;

(c) means for producing said fluidized bed of said solid fuel material in said fluidized bed portion of said reactor and for effectuating gasification of said solid fuel material in said fluidized bed;

(d) means for separating from product gas produced in said reactor at least a portion of solid particle material entrained by the flow of said product gas upwardly from said fluidized bed portion through said post-reaction chamber;

(e) means for discharging said product gas from said separating means;

(f) a recycling conduit having a first end communicating with said separation means and a second end communicating with said reactor, for recycling said separated-off solid material from said separating means to said reactor;

(g) means for introducing gas into said recycling conduit at a plurality of spaced apart locations along a portion of said recycling conduit including a plurality of nozzles, each said nozzle being spaced apart from the next nozzle along a longitudinal axis of said conduit, said plurality of nozzles beginning at a location adjacent said second end of said recycling conduit to loosen up said separated-off solid material therein, thereby maintaining a flow of said separated-off solid material through said recycling conduit; and

(h) means for controlling the injection of gas into said recycling conduit and constructed to provide for successive pulse-wise injection of said gas such that an initial pulse of gas begins at a location adjacent said reactor at said second end of said recycling conduit and successively runs along said plurality of said spaced apart nozzles to an upstream location remote from said reactor.

4,919,688

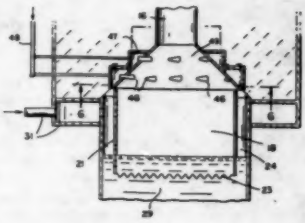
GASIFIER WITH GAS SCROURED THROAT

Robert M. Suggitt, Wappingers Falls, and Mitri S. Najjar, Hopewell Junction, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Continuation of Ser. No. 914,847, Oct. 3, 1986, abandoned. This application Jan. 20, 1988, Ser. No. 147,090

Int. Cl.[5] C10J *3/48, 3/82*

U.S. Cl. 48—69 **3 Claims**



1. A gasifier (10) for combusting a particulated carbonaceous fuel mixture to produce a usable gas and residual solids, comprising:

a shell (11),

means forming a combustion chamber (13) in said shell (11) in which said carbonaceous fuel mixture is combusted,

injector means (26) connected to a supply means of a particulated fuel (25) and to a combustion supporting gas (27) to form said carbonaceous fuel mixture and to direct said mixture into the means forming said combustion chamber (13),

means forming a quench chamber (24) in said shell holding a liquid bath (29) beneath the combustion chamber,

means forming a throat (16) interconnecting said means forming said combustion chamber and said means forming said quench chamber, and having an outwardly divergent wall defining a passage (17) to conduct said usable gas and residual solids from the means forming said combustion chamber toward said liquid bath,

nozzle means having nozzle discharge openings aligned contiguous with said outwardly divergent wall to direct pressurized streams of a scouring gas along said divergent wall to contact and dislodge residual solids which have become deposited thereon,

said nozzle means including a plurality of discrete nozzles arranged in spaced apart layers along said outwardly divergent wall to direct said scouring gas, each of said spaced apart layers of nozzles having an individual manifold carrying said pressurized scouring gas.

4,919,689

SELF-REINFORCED SILICON NITRIDE CERAMIC OF HIGH FRACTURE TOUGHNESS

Aleksander J. Pyzik; Douglas B. Schwarz, both of Midland; William J. Dubensky, Traverse City, and Donald R. Beaman, Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 148,748, Jan. 27, 1988, Pat. No. 4,883,776. This application Feb. 28, 1989, Ser. No. 290,720

Int. Cl.[5] C04B *35/58*

U.S. Cl. 51—309 12 Claims

1. A silicon nitride ceramic body having a fracture toughness greater than about 6 MPa $(m)^{\frac{1}{2}}$, as measured by the Chevron notch technique at about 23° C., consisting essentially of

(a) a crystalline phase of β-silicon nitride of which at least about 20 volume percent, as measured in a plane by scanning electron microscopy, is in the form of whiskers having an average aspect ratio of at least about 2.5; and

(b) a glassy phase in an amount not greater than about 35 weight percent of the total weight comprising magnesium oxide in a range from about 15 percent to about 51 percent, yttrium oxide in a range from about 36 percent to about 63 percent, calcium oxide in a range from about 0.1 percent to about 15 percent, and silica in a range from about 3 percent to about 30 percent by weight.

4,919,690

METHOD FOR PURIFYING A CONTINUOUS FLOW OF HELIUM AND/OR NEON GAS

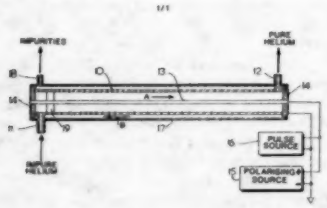
James E. Lovelock, St. Giles on the Heath, Great Britain, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 18,144, Feb. 24, 1987, abandoned. This application Dec. 17, 1987, Ser. No. 133,231

Claims priority, application United Kingdom, Apr. 16, 1986, 8609325

Int. Cl.[5] B03C *1/00*

U.S. Cl. 55—2 3 Claims



1. A method for removing any atoms or molecules which are not either helium or neon from a continuous flow of helium or neon gas, or a mixture of said gases, said method involving the operations of:

passing a stream of the helium or neon gas along a predetermined flow path;

generating a corona discharge across the stream by applying a series of high frequency, high potential, short duration pulses sufficient to raise the mean energy of the stream to between 21 eV and 24 eV, wherein, metastable helium or neon atoms are produced, said metastable atoms serving to ionize other atoms or molecules which are not either helium or neon by losing energy thereto; and

removing the ionized atoms or molecules from the main gas stream by setting up a polarizing field across said stream to cause migration of said other ions out of the stream.

4,919,691

PAINT DETACKIFICATION USING AN IMPROVED OIL-IN-WATER EMULSION WITH DIBASIC ESTER

Robert R. Patzelt, Bloomfield Hills, Mich.; Robert J. Meade, Naperville, and Morris Mindick, Downers Grove, both of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Apr. 17, 1989, Ser. No. 338,820

Int. Cl.[5] B01D *21/01*

U.S. Cl. 55—45 6 Claims

1. In a method of recovering volatile organic paint carrier from paint spray booths and also collecting, detackifying, and dispersing paint solids obtained from paint overspray in said paint spray booths, which paint spray booths are of the type comprising a chamber, a duct system for passing air through said chamber, an exhaust system connected to said duct system, a sump containing a circulating hydrophilic liquid which is pumped onto a means for forming a liquid curtain of said hydrophilic liquid, said liquid curtain being contacted by oversprayed paint and volatile organic paint carrier; the improvement which comprises using as the hydrophilic liquid an improved oil-in-water emulsion maintained at a pH value ranging from 7.5–11.0, which emulsion consists essentially of the ingredients:

(a) from 5–50 weight percent of an organic hydrocarbonaceous liquid having a boiling point of at least 150° C.;

(b) from 0.5–20 weight percent, based on the organic hydrocarbonaceous liquid of an oil-in-water emulsifier;

(c) from 5–100 weight percent, based on the organic hydrocarbonaceous liquid, of a polar organic solvent, which polar organic solvent has a water solubility of less than 10 weight percent (based on total solution), a vapor pressure less than 0.5 Torr at 20° C., a Tag closed cup flash point of at least 90° C., and is easily admixed with said organic hydrocarbonaceous liquid; and

(d) water, the remainder;

and wherein said improved emulsion, or portions thereof, (v) are collected periodically or continuously, (w) broken into separate organic, aqueous, and solid phases by adjusting the pH of the collected portion to a pH of from about 3.0 to about 6.5, and (x) recovering from said aqueous, organic, and solid phases some portion, or all of said paint solids and volatile organic paint carriers; and (y) further recovering said organic hydrocarbonaceous liquid, said polar organic solvent, said emulsifiers and said water, and then;

(z) reforming a recycled improved emulsion by using said recovered organic hydrocarbonaceous liquid, said recovered polar organic solvent, said recovered emulsifiers and water by admixing same and adjusting the pH to a range between 7.5–11.0, and then reusing the recycled improved emulsion as the hydrophilic liquid in the paint spray booth, and then repeating steps v, w, x, y, and z.

4,919,692

PROCESS FOR REMOVING SOLVENTS AND OTHER CONTAMINANTS FROM AN INLET SOLVENT LADEN AIR PATH

Tomas E. Vara, and Clyde Anderson, both of Vero Beach, Fla., assignors to Vara International, Inc., Vero Beach, Fla.

Filed Dec. 19, 1988, Ser. No. 286,655

Int. Cl.[5] B01D *53/04*

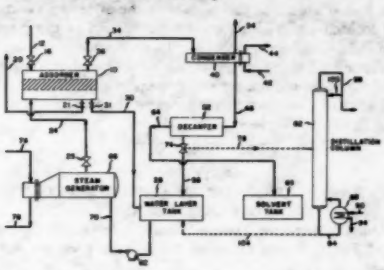
U.S. Cl. 55—59 3 Claims

1. A process for regenerating adsorbents used to remove solvents from an inlet solvent laden air (SLA) path, said solvents being at least partially miscible in water, comprising the steps of:

(i) passing steam through the adsorbent to desorb solvents from the adsorbent;

(ii) condensing the steam and solvents leaving the adsorbent to produce a condensate;

(iii) distilling the condensate into at least one solvent-rich fraction and a water fraction;



(iv) generating steam from the water fraction of the distillation step (iii); and,

(v) recycling the steam of step (iv) to the desorption step (i).

4,919,693

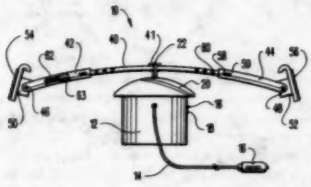
ELECTROSTATIC AIR CLEANER

Richard A. Olney, P.O. Box 534, O'Neill, Nebr. 68763

Filed Mar. 29, 1989, Ser. No. 330,066

Int. Cl.[5] B03C 3/00

U.S. Cl. 55—124 **10 Claims**



1. An electrostatic air cleaner for use in vehicles, comprising:

a hollow housing defining an interior air flow path;

an air inlet opening in a bottom of said housing;

an electrostatic precipitator in said housing;

a charcoal filter in said housing;

an air outlet opening adjacent a top portion of said housing, on a downstream side of said charcoal filter for returning purified air to said vehicle interior;

a fan in said housing for inducting air from a vehicle interior through said air inlet opening, said electrostatic precipitator, said charcoal filter, and exhausting air through said air outlet opening; and

a telescoping rod connected to said housing and having frictional pads for engagement with opposite side walls of a vehicle for securing said housing adjacent an interior ceiling of a vehicle.

4,919,694

SELECTIVE GAS PERMEATION MEMBRANES AND METHOD OF MANUFACTURING THEM

Yasuo Hata, and Kenkichi Takahashi, both of Sodegaura, Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Filed Dec. 27, 1988, Ser. No. 290,342

Claims priority, application Japan, Dec. 28, 1987, 62-332783; Apr. 11, 1988, 62-88481; Apr. 11, 1988, 62-88482

Int. Cl.[5] B01D 53/22

U.S. Cl. 55—158 **6 Claims**

1. A selective gas permeation membrane, comprising a porous substrate the inner walls of the pores of which are coated with a crosslinked organosiloxane polymer having a penetration degree of about 20 to 150 and containing voids in the central portion of at least a substantial number of said pores.

4,919,695

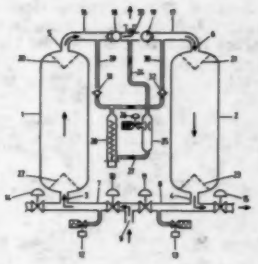
APPARATUS FOR DRYING GAS

Pierre Trepaud, 17, rue Legendre, 75017 Paris, France

Filed Apr. 24, 1989, Ser. No. 342,161

Int. Cl.[5] B01D 53/04

U.S. Cl. 55—179 **5 Claims**



1. Apparatus for drying gas comprising an entry and an exit, two adsorbers mounted in parallel between the entrance and the exit by inlet and exit conduits; a jet pump having an inlet, suction means and delivery means; heating means mounted on the delivery means; means which put selectively only one of the exit conduits in communication with the delivery means; means which put the inlet in communication only with the other of the exit conduits; and a valve mounted on the suction means.

4,919,696

SUPERCOOLING TYPE MIST ELIMINATOR APPARATUS

Tsuneo Higashi, Mihara, and Akio Izuwa, Hiroshima, both of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 26, 1988, Ser. No. 262,877

Claims priority, application Japan, Oct. 30, 1987, 62-273464

Int. Cl.[5] B01D 35/18, 46/40

U.S. Cl. 55—269 **4 Claims**

1. A supercooling type mist eliminator apparatus, comprising:

a gas passageway adapted to have flowing therethrough a wet exhaust gas containing particles of dust and mist;

a crimped-plate mist eliminator in said gas passageway for removing by inertial collision the particles of dust and mist contained in the wet exhaust gas;

an exhaust gas cooling means disposed upstream of said crimped-plate mist eliminator, said exhaust gas cooling means including supercooling elements and non-cooling sections alternately disposed adjacent to one another along a plane perpendicular to the direction of gas flow in said gas passageway, said supercooling elements and said

noncooling sections being separated by gas passageway partition plates; and

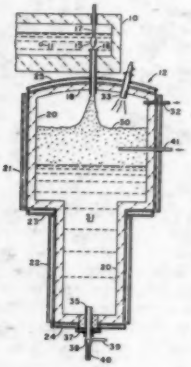
an exhaust gas mixing means disposed upstream of said crimped-plate mist eliminator and just downstream of and adjacent to said exhaust gas cooling means.

4,919,697

VACUUM REFINING OF GLASSY MATERIALS WITH SELECTED FOAMING RATE

George A. Pecoraro, Lower Burrell; Larry J. Shelestak, Bairdford, and Joseph E. Cooper, Natrona Heights, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 3, 1989, Ser. No. 292,971
Int. Cl.[5] C03B 5/225
U.S. Cl. 65—134 17 Claims



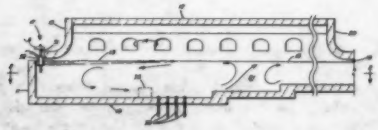
1. In a method of refining glassy material wherein batch material is melted and a stream of the resulting molten material is foamed as it passes into a vessel in which subatmospheric pressure is maintained to remove gases from the molten material, the improvement comprising increasing the foaming by adding to the material upstream from the foaming step a sufficient amount of a volatile substance to produce at least an eight-fold volume increase as the material is foamed, whereby removal of the gases from the molten material is increased.

4,919,698

AVOIDANCE OF NICKEL SULFIDE STONES IN A GLASS MELTING OPERATION

Leonard A. Knavish, Plum Borough, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 21, 1989, Ser. No. 369,450
Int. Cl.[5] C03B 5/16
U.S. Cl. 65—134 8 Claims



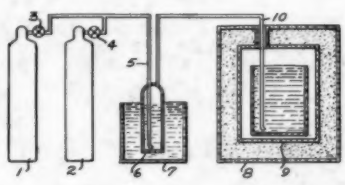
1. In a method of melting glass wherein relatively cold feed material is fed onto a pool of melting glass at an upstream end of a furnace, molten glass is withdrawn at a downstream end of a furnace longitudinally spaced from the upstream end, and heat for melting is provided to the furnace whereby a spring zone of rising glass currents is established in the pool at an intermediate location spaced from the upstream end and the downstream end, the improvement comprising applying direct current to the pool of molten glass by means of at least one anode and at least one cathode, with the at lease one anode being located closely adjacent to the bottom of the pool of melting glass in the region of the furnace upstream from the spring zone of rising currents, so as to maintain oxidizing conditions in the bottom region of the pool upstream from the spring zone of rising currents to suppress the presence of nickel sulfide stones in the glass.

4,919,699

PROCESS OF REMOVING PLATINUM INCLUSIONS FROM LASER GLASS

Michimasa Matsukawa; Tetsuro Izumitani, and Kunio Takeuchi, all of Tokyo, Japan, assignors to Hoya Corporation, Tokyo, Japan

Continuation of Ser. No. 894,058, Aug. 7, 1986, abandoned. This application Jul. 21, 1988, Ser. No. 222,286
Claims priority, application Japan, Aug. 9, 1985, 60-174024
Int. Cl.[5] C03B 5/225, 5/235
U.S. Cl. 65—134 7 Claims



1. A process for forming a laser glass by removing platinum inclusions from the laser glass, said inclusions having been formed while said laser glass was in a molten state, said process comprising the following steps:

placing glass, having a composition which permits it to be used as a laser glass in a vessel, said vessel having at least an interior surface of platinum, said glass contacting at least a portion of said platinum;

heating said glass in said vessel, so that said glass is heated at least to the point of said glass being molten and a portion of said platinum, which remains in contact with the glass is eluted into said glass, said glass having sufficiently reduced viscosity to enable a gas to bubble through;

bubbling PCl_3 or $POCl_3$ vapors and an O_2 carrier gas which contains N_2 gas so as to prevent coloration and ultraviolet ray absorption of said laser glass, through said molten glass for a time period sufficient to remove said platinum inclusions by reacting said platinum inclusions with PCl_3 or $POCl_3$ to ionize said platinum inclusions in the form of a complex ion of platinum and chlorine resulting in said molten glass being substantially free of platinum inclusions; and

forming a laser glass from said molten glass.

4,919,700

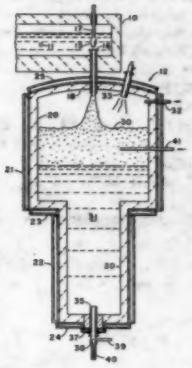
VACUUM REFINING OF GLASSY MATERIALS WITH SELECTED WATER CONTENT

George A. Pecoraro, Lower Burrell; Larry J. Shelestak, Bairdford, and Joseph E. Cooper, Natrona Heights, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 3, 1989, Ser. No. 292,718
Int. Cl.[5] C03B 5/225
U.S. Cl. 65—134 10 Claims

1. In a method of refining glassy material wherein batch material is melted and a stream of the resulting molten material is foamed as it passes into a vessel in which subatmospheric pressure is maintained to remove gases from the molten material, the improvement comprising increasing the foaming by controlling the amount of water to at least 0.05 percent by

weight in the molten material upstream from the foaming step so that vaporization of water in the subatmospheric pressure



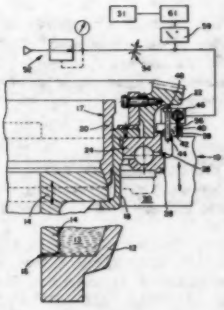
vessel enhances volume expansion during the foaming, whereby removal of gases from the molten material is increased.

4,919,701

FEEDER ASSEMBLY FOR A GLASS CONTAINER MANUFACTURING MACHINE

Alan W. Menard, Bolton; John E. Suomala, Simsbury, and Richard A. Walker, North Granby, all of Conn., assignors to Emhart Industries, Inc., Hartford, Conn.

Filed Jul. 21, 1989, Ser. No. 383,950
Int. Cl.[5] C03B *7/08*
U.S. Cl. 65—158 **2 Claims**



1. A feeder assembly for delivering molten glass to an individual section machine comprising:

a spout bowl,

a tube for defining with said spout bowl a selected opening through which molten glass may flow for delivery to the individual section machine,

an annular thrust bearing having an upper race and a lower race

unitary tube chucking means for supporting said tube including

a tube support for supporting said tube,

a tube clamp for clamping said tube on said tube support,

the upper race of said thrust bearing extending around said tube support, and

annular bevel gear means on top of said upper race, and

jack means for supporting said tube chucking means for vertical displacement, said jack means including said lower race of the thrust bearing,

jack housing means for supporting said lower race, and

motor means for displacing said jack housing means,

said jack housing means having a flat annular horizontal surface,

annular ring means including a selected plurality of flat pads for matingly resting on said flat annular horizontal surface,

said annular ring means including portions projecting over said upper race and having a selected vertical spacing therefrom, so that once the tube is lowered into engagement with said spout bowl, continued lowering of said jack housing means will result in at least one of said projecting portions engaging said upper race and lifting at least on of said flat pads off of said flat annular horizontal surface,

air conduit means extending through each of said pads and through the adjacent ring portion to said flat annular surface, and

pressurized air supply means for supplying air under pressure to each of said air conduit means and including means for signalling a drop of pressure which occurs whenever one of said pads is lifted away from said annular surface to indicate that said tube has engaged said spout bowl and

motor control means for receiving said signal and stopping the operation of said motor responsive thereto.

4,919,702

FERTILIZER AND/OR SOIL AMENDMENT

Robert F. Weltzien, and Graeme Berlyn, both of Hamden, Conn., assignors to Soilizer Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 191,954, May 9, 1988, Pat. No. 4,846,870. This application May 3, 1989, Ser. No. 345,521
Int. Cl.[5] C05F *11/02*
U.S. Cl. 71—24 **9 Claims**

1. A solution suitable for use as a fertilizer, said solution consists essentially of from about 0.1% to about 10% L ascorbic acid, from about 10% to about 50% marine algae, from about 3.0% to about 20% nitrogen, from about 3.0% to about 20% phosphorous, from about 3.0% to about 20% potassium, and the balance humic acid in a water solution.

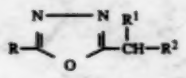
4,919,703

METHOD OF STIMULATING THE GROWTH OF PLANTS EMPLOYING SUBSTITUTED OXADIAZOLES

Allen R. Blem, Cheshire; Howard L. Plant, Milford, and Richard R. Regis, Harwinton, all of Conn., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn.

Filed Aug. 19, 1988, Ser. No. 234,439
Int. Cl.[5] A01N *43/82, 57/16*
U.S. Cl. 71—86 **3 Claims**

1. A method for stimulating the growth of plants, which method comprises applying directly to plant seeds prior to germination an effective plant growth stimulatory amount of a compound having the structural formula:



(I)

wherein:

R is

C_1–C_{12} alkyl,

C_3–C_6 cycloalkyl,

C_3–C_6 cycloalkyl substituted with one or more members selected from the group consisting of halogen and C_1–C_3 alkyl,

allyl,

C_3–C_5 alkoxycarbonylmethyl,

C_7–C_9 aralkyl,
styryl,
phenyl,
naphthyl,
furanyl,
pyridyl,
thienyl,
phenyl substituted with halogen C_1–C_4 alkyl, trihalomethyl, C_1–C_4 alkoxy, trihalomethoxy, trihalomethylthio, C_1–C_4 alkylthio, phenyl, phenoxy, cyano or nitro; or
C_7–C_9 aralkyl substituted with halogen C_1–C_4 alkyl, trihalomethyl, C_1–C_4 alkoxy, trihalomethoxy, trihalomethylthio, C_1–C_4 alkylthio, phenyl, phenoxy, cyano or nitro;

R^1 is
hydrogen,
C_1–C_3 alkyl,
C_7–C_9 aralkyl,
phenyl,
C_7–C_9 aralkyl substituted with halogen, C_1–C_4 alkyl, trihalomethyl, C_1–C_4 alkoxy, trihalomethoxy, trihalomethylthio, C_1–C_4 alkylthio, phenyl, phenoxy, cyano or nitro, or
phenyl substituted with halogen, C_1–C_4 alkyl, trihalomethyl, C_1–C_4 alkoxy, trihalomethoxy, trihalomethylthio, C_1–C_4 alkylthio, phenyl, phenoxy, cyano or nitro;

R^2 is halogen or a radical of the formula:

wherein R^3 and R^4 are each independently C_1–C_4 alkyl; and A, Y and Z are each independently oxygen or sulfur.

4,919,704

4,5,6,7-TETRAHYDROISOINDOLE-1,3-DIONES

Hans Moser, Rheinfelden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

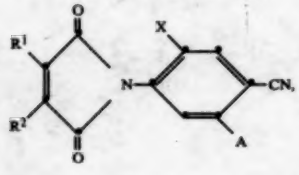
Filed Aug. 1, 1988, Ser. No. 226,701

Claims priority, application Switzerland, Aug. 14, 1987, 3132/87-9

Int. Cl.[5] A01N *37/32*; C07D *209/48*

U.S. Cl. 71—96 **7 Claims**

1. A compound of formula I



(I)

wherein

R^1 and R^2, taken together, are a $(CH_2)_4$ chain which may be substituted by one or two (C_1–C_4)-alkyl groups;

X is halogen;

A is O—R^4;

R^4 is (C_1–C_8)-alkyl.

4,919,705

TRIFLUOROMETHANESULFONAMIDE DERIVATIVE, A METHOD FOR THE PREPARATION THEREOF AND A HERBICIDE CONTAINING THE SAME

Mitsuru Shibata; Yoshiyuki Hiramatsu; Ryoichi Adachi, and Kenichiro Mitsutake, all of Sodegaura, Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

PCT No. PCT/JP88/00104, § 371 Date Jun. 6, 1988, § 102(e) Date Jun. 6, 1988, PCT Pub. No. WO88/06155, PCT Pub. Date Aug. 25, 1988

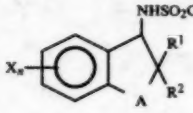
PCT Filed Feb. 4, 1988, Ser. No. 254,935

Claims priority, application Japan, Feb. 10, 1987, 62-27127; Jul. 27, 1987, 62-185380

Int. Cl.[5] A01N *42/72*; C07D *279/02*

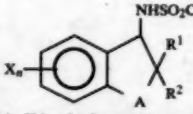
U.S. Cl. 71—90 **7 Claims**

1. A trifluoromethanesulfonamide derivative represented by the general formula



wherein X is a hydrogen atom, a halogen atom, an alkyl group having 1 to 4 carbon atoms or a haloalkyl group having 1 to 4 carbon atoms, n is 1, 2 or 3 and A is —SO_2—NR^3— and R^1, R^2, R^3, and R^4 are each a hydrogen atom or an alkyl group having 1 to 4 carbon atoms.

5. A herbicide comprising a carrier and a trifluoromethanesulfonamide derivative represented by the general formula



wherein X is a hydrogen atom, a halogen atom, an alkyl group having 1 to 4 carbon atoms or a haloalkyl group having 1 to 4 carbon atoms, n is 1, 2 or 3 and A is —SO_2—NR^3— and R^1, R^2, R^3 and R^4 are each a hydrogen atom or an alkyl group having 1 to 4 carbon atoms.

4,919,706

THIAZOLE DERIVATIVES

James V. Hay, Newark, Del., and Anthony D. Woif, Elkton, Md., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 609,695, May 14, 1984, which is a continuation of Ser. No. 479,363, Apr. 4, 1983, abandoned. This application Oct. 3, 1985, Ser. No. 783,921

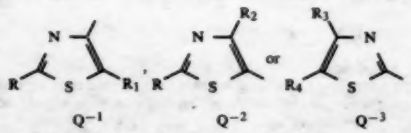
Int. Cl.[5] C07D *417/12*; A01N *47/36*

U.S. Cl. 71—90 **12 Claims**

1. A compound of the formula:

$QSO_2NHCONHA$

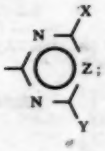
where
Q is



Q^{-1} Q^{-2} Q^{-3}

R is H, C_1–C_3 alkyl or $CH_3C(O)NH$;

R_1 is H, C_1–C_3 alkyl, C_1–C_3 alkoxy, C_1–C_3 alkylthio or C_1–C_3 alkoxycarbonyl;
R_2 is H, C_1–C_3 alkyl, C_1–C_3 alkoxy, C_1–C_3 alkylthio, C_1–C_3 alkoxycarbonyl, NO_2, Cl, Br or CF_3;
R_3 is H, Cl or CH_3;
R_4 is H, Cl or CH_3;
A is



X is CH_3, OCH_3, OC_2H_5 or CH_2OCH_3;
Y is CH_3, or OCH_3; and
Z is N;
provided that R_3 and R_4 are not simultaneously Cl, and agriculturally suitable salts thereof.

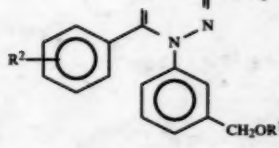
4,919,707

DERIVATIVE OF 1,5-DIPHENYL-1H-1,2,4-TRIAZOLE-3-CARBOXAMIDE AND HERBICIDAL COMPOSITION CONTAINING THE SAME

Takafumi Shida; Hideo Arabori; Takeo Watanabe; Yohichi Kanda; Shiro Yamazaki, and Hiroyasu Shinkawa, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 24, 1987, Ser. No. 42,321
Claims priority, application Japan, Mar. 19, 1987, 62-65274
The portion of the term of this patent subsequent to Apr. 11, 2006, has been disclaimed.
Int. Cl.[5] A01N *43/653*; C07D *249/10*
U.S. Cl. 71—92 **17 Claims**

1. A derivative of 1,5-diphenyl-1H-1,2,4-triazole-3-carboxamide represented by the formula (I):



(I)

wherein R^1 represents a straight-chain alkyl group of 2 to 10 carbon atoms; a branched-chain alkyl group or cycloalkyl group of 3 to 10 carbon atoms; a (cycloalkyl)alkyl group of 4 to 10 carbon atoms; a non-substituted- or halogen-substituted phenyl group; an aralkyl group of 7 to 9 carbon atoms; an alkenyl group of 3 to 6 carbon atoms or an alkyl group of 2 to 10 carbon atoms, which has been substituted by 1 to 19 fluorine atoms, and R^2 represents a fluorine atom.

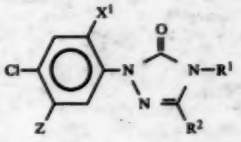
4,919,708

HALOALKYL TRIAZOLINONES AND HERBICIDAL USE THEREOF

Lester L. Maravetz, Westfield, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Continuation of Ser. No. 102,303, Sep. 25, 1987, abandoned, which is a continuation of Ser. No. 825,520, Feb. 3, 1986, abandoned, which is a continuation-in-part of Ser. No. 697,619, Feb. 4, 1985, abandoned, which is a continuation-in-part of Ser. No. 655,960, Sep. 28, 1984, abandoned, which is a continuation-in-part of Ser. No. 541,596, Oct. 13, 1983, abandoned, which is a continuation-in-part of Ser. No. 650,755, Sep. 13, 1984, abandoned, which is a continuation-in-part of Ser. No. 533,013, Sep. 15, 1983, abandoned, which is a continuation-in-part of Ser. No. 666,933, Oct. 31, 1984, abandoned. This application Jun. 26, 1989, Ser. No. 372,207
Int. Cl.[5] A01N *43/36*; C07D *249/12*
U.S. Cl. 71—92 **5 Claims**

1. An herbicidal compound of the formula



in which
X^1 is F or Cl;
Z is nitro or a group of the formula —OR, —CO—R^6, —CH_2CO—R^6, or —CH(CH_3)CO—R^6;
R is alkyl of 1 to 6 carbon atoms which is unsubstituted or is substituted with cycloalkyl or 3 to 7 carbon atoms, cycloalkyl of 3 to 7 carbon atoms which is unsubstituted or is substituted with alkyl of 1 to 6 carbon atoms, alkoxyalkyl of 2 to 8 carbon atoms, cyanoalkyl of 2 to 7 carbon atoms, alkenyl of 2 to 5 carbon atoms, alkynyl of 2 to 5 carbon atoms, haloalkyl of 1 to 5 carbon atoms, haloalkenyl of 2 to 5 carbon atoms, haloalkynyl of 2 to 5 carbon atoms, alkylsulfonyl of 1 to 6 carbon atoms (wherein the alkyl moiety is unsubstituted or is substituted with F, Cl, CN, alkoxy or alkylthio of 1 to 4 carbon atoms, or alkylamino or dialkylamino in which each alkyl is of 1 to 4 carbon atoms), alkylaminosulfonyl or dialkylaminosulfonyl in which each alkyl is of 1 to 4 carbon atoms, alkylcarbonyl of 2 to 7 carbon atoms, or a group of the formula —C(R^3)(R^4)(CH_2)$_n$—CO—Q^1R^5 or —C(R^3)(R^4)(CH_2)$_n$—CO—N(R^7)(R^8) in which n is 0 to 2;
R^3 and R^4 are independently H, alkyl of 1 to 4 carbon atoms, or alkoxy of 1 to 4 carbon atoms;
Q^1 is O or S;
R^5 is H, alkyl of 1 to 6 carbon atoms, alkoxyalkyl or alkylthioalkyl of 2 to 6 carbon atoms, haloalkyl of 1 to 5 carbon atoms, alkenyl of 2 to 5 carbon atoms, cycloalkenyl of 5 to 7 carbon atoms which is unsubstituted or is substituted with alkyl of 1 to 4 carbon atoms, cyclohexenylalkyl of 6 to 10 carbon atoms, phenyl or benzyl (which may be ring-substituted with fluorine, chlorine, bromine, or alkyl, alkoxy, or alkylthio of 1 to 4 carbon atoms), cyanoalkyl of 2 to 7 carbon atoms, alkynyl of 2 to 5 carbon atoms, alkylideneamino of 1 to 6 carbon atoms which is unsubstituted or is substituted with cycloalkyl 3 to 7 carbon atoms, or cycloalkylideneamino of 5 to 7 carbon atoms, which is unsubstituted or is substituted with alkyl of 1 to 4 carbon atoms;
R^6 is hydroxy, alkoxy or alkylthio of 1 to 6 carbon atoms, alkoxyalkoxy of 2 to 6 carbon atoms, amino, or alkylamino or dialkylamino wherein each alkyl is of 1 to 6 carbon atoms and is unsubstituted or is substituted with alkoxy of 1 to 4 carbon atoms;
R^7 is H or alkyl of 1 to 6 carbon atoms;
R^8 is R^5 or alkoxy of 1 to 6 carbon atoms, alkylthio of 1 to 6

carbon atoms, alkylsulfonyl of 1 to 6 carbon atoms, phenylsulfonyl, or phenylalkylsulfonyl of 1 to 3 alkyl carbon atoms;

R^1 is alkyl of 1 to 4 carbon atoms or haloalkyl of 1 to 3 carbon atoms; and

R^2 is fluoroalkyl of 1 to 4 carbon atoms.

4. An herbicidal composition comprising an herbicidally effective amount of a compound of claim 1 in admixture with a suitable carrier.

5. A method for controlling undesired plant growth which comprises applying to the locus where control is desired an herbicidally effective amount of the composition of claim 4.

4,919,709

N-(1'-METHYL-2'-METHOXYETHYL)-N-CHLOROACETYL-2,6-DIMETHYLANILINE AS HERBICIDE

Hans Moser, Magden, and Christian Vogel, Binningen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 570,709, Jan. 13, 1984, abandoned. This application Dec. 7, 1984, Ser. No. 679,438

Claims priority, application Switzerland, Jan. 25, 1983, 399/83

Int. Cl.[3] A01N *37/22*

U.S. Cl. 71—118 **1 Claim**

1. The method of selectively combating *Echinochloa crus galli* in rice crops under flooded conditions which comprises applying post-emergently to said crops or the environs of their growth S(−)-(1'-methyl-2'-methoxyethyl)-N-chloroacetyl-2,6-dimethylaniline, substantially free of its R anantiomer, at a rate of from about 0.125 to about 0.5 kg/ha.

4,919,710

CONDENSATE DRAINAGE APPARATUS

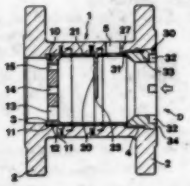
Masao Seki, Chiba, and Hiroki Higashino, Tokyo, both of Japan, assignors to Mitsui Petrochemical Industries, Ltd. and Ciluck Co., Ltd., both of Tokyo, Japan

Filed Feb. 19, 1988, Ser. No. 157,618

Claims priority, application Japan, Feb. 20, 1987, 62-22653[U]; Jun. 23, 1987, 62-154513; Jun. 23, 1987, 62-154514

Int. Cl.[5] B01D *35/02*

U.S. Cl. 55—417 **7 Claims**



1. An apparatus for draining condensate from vapor equipment comprising:

a cylindrical casing having two ends and defining a flow communication path for conveying condensate, wherein one end is connected in fluid communication with the vapor equipment and the other end drains the condensate;

an orifice disk disposed in said casing to traverse the flow path and having a plurality of orifices formed therein;

at least one partition disposed in said casing upstream of said orifice disk with a predetermined spacing therefrom, said partition covering a predetermined portion of the flow path; and

a combination of the at least one partition and the orifice disk wherein the condensate and the vapor are separated by the combination, which generally presents further downstream flow of the vapor while allowing the condensate to be drained through the orifice disk, separation of condensate and vapor utilizing gravity.

4,919,711

BINDER FOR METAL-CONTAINING ORES

Bruce E. Banyai, Hockessin; Denis E. LaSota, and Dennis L. Struck, both of Wilmington, all of Del., assignors to Aqualon Company, Wilmington, Del.

Continuation-in-part of Ser. No. 67,753, Jun. 29, 1987, Pat. No. 4,863,512. This application May 1, 1989, Ser. No. 347,114

Claims priority, application European Pat. Off., Jun. 29, 1988, 88.110395.6

Int. Cl.[5] C22B *1/16*

U.S. Cl. 75—321 **20 Claims**

1. A process for agglomerating a concentrated ore, which process comprises:

(a) preparing a mixture comprising a binding amount of a binder composition containing a binding amount of (i) water-soluble polymer selected from the group consisting of alkali metal salts of carboxymethyl cellulose and carboxymethyl hydroxyethyl cellulose and (ii) sodium tripolyphosphate, the concentrated ore and water, said water-soluble polymer and said sodium tripolyphosphate being added simultaneously, successively, or alternatively;

(b) agglomerating the mixture into wet balls; and

(c) drying the wet balls and then firing the resultant dry balls at a temperature of at least about 2200° F.,

wherein the mixture contains from about 0.022% to about 0.067% of the binder composition, by weight of the dry mixture, and from 5% to about 20% water, based on total weight of the moist mixture, and the binder composition contains from about 10% to about 90% of the water-soluble polymer and from about 5% to about 90% of the sodium tripolyphosphate, by weight of the total dry binder composition.

4,919,712

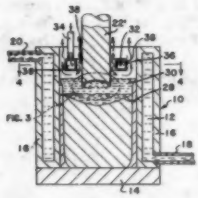
METHOD AND APPARATUS FOR ADJUSTING ELECTRODE ISOTHERMS WITHIN ELECTRO-SLAG REMELTING

Raymond J. Roberts, West Berlin, N.J., assignor to Consarc Corporation, Rancocas, N.J.

Filed May 15, 1989, Ser. No. 351,757

Int. Cl.[5] C22B *4/00*

U.S. Cl. 75—10.24 **7 Claims**



1. A method of electro-slag remelting comprising the steps of:

providing a consumable electrode,

establishing a slag layer in a mold cavity,

resistance heating the slag layer by passing an electric current between the electrode and the base of the mold cavity,

immersing one end of the electrode into the slag layer,

progressively melting the end of the electrode and forming a molten metal pool in the mold cavity under the slag layer,

cooling the mold cavity to continuously solidify the molten metal pool, and

controlling the melting pattern of the electrode by intensely cooling the circumferentially exposed surface of the elec-

trode adjacent its immersion into the slag layer such that the end of the electrode immersed in the slag layer is caused to maintain a concave shape during said progressive melting.

4,919,713

PROCESS FOR PRODUCING CHROMIUM CONTAINING MOLTEN IRON

Sumio Yamada; Chikashi Tada; Keizo Taoka, and Hajime Bada, all of Chiba, Japan, assignors to Kawasaki Steel Corp.

Filed Feb. 23, 1989, Ser. No. 315,407
Claims priority, application Japan, Feb. 24, 1988, 63-39719
Int. Cl.[5] C21C 7/00
U.S. Cl. 75—532 17 Claims

1. A process for producing chromium containing molten iron, wherein

a chromium containing iron scrap and molten pig iron are charged into a top and bottom-blown converter for forming a molten iron bath the separate steps (a) and (b) which comprise:

(a) performing a scrap melting and heating step comprising top and bottom blowing of oxygen while charging a carbon containing material and a slag forming agent through the top of said converter for melting said chromium containing iron scrap and heating ssaid molten iron bath to a predetermined temperature; and

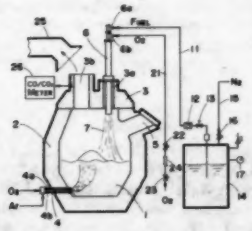
(b) performing a reduction step subsequent to said scrap melting and heating step, said reduction step comprising top and bottom blowing of oxygen while charging carbon containing material and chromium oxide through the top of said converter for reducing chromium and thus forming a chromium containing molten iron.

4,919,714

METHOD AND APPARATUS FOR REFINING STEEL

Saburo Sugiura; Senji Fujita, both of Nagoya; Hiroya Nakata; Tetsuo Okamoto, both of Chita; Yoshio Inaguki, Aichi; Keiichi Mizuguchi, and Atsushi Ishii, both of Tokai, all of Japan, assignors to Daido Tokushuko Kabushiki Kaisha, Nagoya, Japan

Filed Nov. 14, 1988, Ser. No. 270,859
Int. Cl.[5] C21C 7/00
U.S. Cl. 75—529 16 Claims



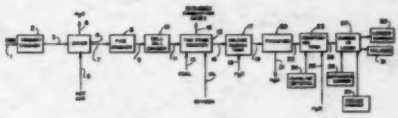
1. A method of refining steel which comprises carrying out the refining while stirring molten steel in a furnace by injecting gas thereinto, and while supplying heat by a burner equipped at the top of the furnace to the molten steel through the surface thereof enlarged due to the stirring.

4,919,715

TREATING REFRACTORY GOLD ORES VIA OXYGEN-ENRICHED ROASTING

Jay C. Smith, Pearl River; Thomas H. McCord, Harvey, both of La., and Gregory R. O'Neil, Marmion, Australia, assignors to Freeport McMoRan Inc., New Orleans, La.

Filed Jun. 3, 1988, Ser. No. 201,952
Int. Cl.[5] C22B 11/00
U.S. Cl. 75—423 19 Claims



1. A method for treating refractory gold-containing ores, said ores having a concentration of substances selected from the group consisting of refractory sulfidic matter, carbonaceous matter and mixtures thereof, to make said ores amenable to gold recovery processes comprising roasting said ores with pure oxygen at a temperature of about 1000° F. to about 1200° F.

4,919,716

METHOD FOR DISSOLUTION OF METAL

Yukimichi Nakao; Kyoji Kaeriyama, and Aizo Yamauchi, all of Tsukuba, Japan, assignors to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan

Filed Mar. 7, 1989, Ser. No. 319,720
Claims priority, application Japan, May 19, 1988, 63-122852
Int. Cl.[5] C22B 3/00
U.S. Cl. 423—658.5 10 Claims

1. A method for dissolving a metal in a halogenated hydrocarbon, which method consists essentially of causing said metal to contact at least one liquid halogenated hydrocarbon in the presence of a cationic surfactant.

4,919,717

SINTERED COMPOSITE MATERIAL FOR ELECTRICAL CONTACT

Jean Ambier, Grenoble; Marie-Jo Francillon; Colette Allibert, both of St. Martin D'Heres, and Catherine Laugee, Paris, all of France, assignors to Merlin Gerin, France

Filed Apr. 25, 1988, Ser. No. 185,980
Claims priority, application France, May 4, 1987, 87 06286
Int. Cl.[5] B22F 7/00
U.S. Cl. 75—228 3 Claims

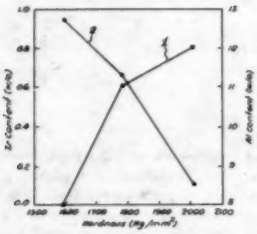
1. A sintered copper-based composite material for electrical contacts, comprising 80-95% by weight copper, 2-15% by weight nickel, and 2-5% by weight graphite, wherein said material is obtained from copper powder of a spongy form, said powder having an average diameter of less than 24μm, an oxygen content of lower than 2000 ppm and a purity in metallic elements of 99.5%.

4,919,718

DUCTILE Ni_3AL ALLOYS AS BONDING AGENTS FOR CERAMIC MATERIALS

Terry N. Tiegs, Lenoir City, Tenn., and Robert R. McDonald, Traverse City, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 22, 1988, Ser. No. 146,992
Int. Cl.[5] C22C *29/12*
U.S. Cl. 75—232 **18 Claims**



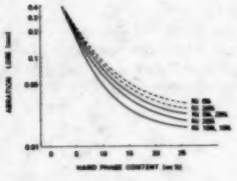
1. A composition consisting essentially of a ceramic material and a ductile metal alloy selected from the group consisting of alloys of Ni_3Al, $TiSi_2$, NiSi, $MoSi_2$, and mixtures thereof.

4,919,719

HIGH TEMPERATURE WEAR RESISTANT SINTERED ALLOY

Makoto Abe; Ichiro Tanimoto, both of Yokohama; Akira Fujiki, Yokosuka; Keitaro Suzuki; Hiroyuki Endo, both of Abiko, and Yutaka Ikenoue, Matsudo, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Hitachi Powdered Metals Co., Ltd., Matsudo, both of, Japan

Filed Aug. 29, 1988, Ser. No. 237,038
Claims priority, application Japan, Sep. 10, 1987, 62-225196
Int. Cl.[5] C22C *29/00*
U.S. Cl. 75—243 **7 Claims**



1. A high temperature wear resistant sintered alloy comprising a matrix consisting essentially of carbon ranging from 0.45 to 1.15% by weight, nickel ranging from 5.4 to 27% by weight, molybdenum ranging from 0.4 to 2.7% by weight, cobalt ranging from 4.2 to 7.2% y weight, and balance substantially iron, said matrix comprising a mixture of at least one of sorbite structure and bainite structure and austenite structure, said matrix having a hard phase ranging from 5 to 25% by weight and dispersed in said matrix.

4,919,720

ELECTROLESS GOLD PLATING SOLUTIONS

Robert Stavitsky, Bronx, N.Y., assignor to LeaRonal, Inc., Freeport, N.Y.

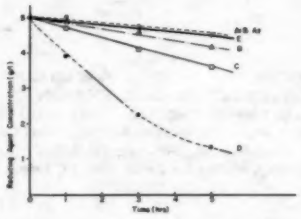
Filed Jun. 30, 1988, Ser. No. 213,382
Int. Cl.[5] C23C *3/02, 16/00*
U.S. Cl. 106—1.26 **30 Claims**

1. An electroless or autocatalytic gold plating solution comprising:

a source of cyanide ions;

a soluble gold compound capable of forming a gold cyanide complex in the solution;

a reducing agent; and



a solvent for the preceding components comprising between at least 50 to 100% by weight of a water soluble organic glycol which enables the solution to remain stable in the presence of nickel ions, with the balance, if any, being water.

4,919,721

AIR-DRYING STAINS AND FINISHING COATS FOR WOOD FOR EXTERIOR AND INTERIOR FINISHES

Siegbert Hermann, Everswinkel, Fed. Rep. of Germany, assignor to Ostermann & Scheiwe GmbH & Co. KG, Muenster, Fed. Rep. of Germany

Filed May 19, 1988, Ser. No. 196,033
Claims priority, application Fed. Rep. of Germany, May 21, 1987, 3717099
Int. Cl.[5] C09K *3/00*; C08L *91/00*
U.S. Cl. 106—34 **2 Claims**

1. A non-aqueous composition for an air-dryable stain and finishing coat for wood for exterior and interior finishes, which comprises a nonvolatile mixture of chemically modified natural oils, together with pigments, extenders and varnish additives, and further comprising a

volatile low-boiling petroleum hydrocarbon, which is suitable as a solvent and is present in an amount of less than or equal to 15% by weight, based on the total amount, and

a mixture of chemically modified natural oils having a consistency whereby the efflux time from a DIN 53 211 4 mm viscosity cup or the equivalent No. 4 Ford Cup-ASTM 1200-58 of said chemically modified natural oils is between 28 and 35 seconds and is present in an amount of from 35–65% by weight, and

wherein the extender comprises a fine, cryptocrystalline, amorphous silicon dioxide wherein more than 95% of the silicon dioxide particles have a particle size of less than 40 micrometer, and is present in an amount of from 15–30 per cent by weight, and

wherein the composition results in a smooth one-coat stain and finish.

4,919,722

METHOD OF MANUFACTURING A GRANULAR BUILDING MATERIAL FROM REFUSE

Fernando Trivino Vazquez, Madrid, Spain, and Roger J. Clenin, Puplinge, Switzerland, assignors to S.A. Societe d'Etudes et d'Applications Industrielles, Geneva, Switzerland

Filed Dec. 29, 1987, Ser. No. 139,308
Claims priority, application Switzerland, Mar. 19, 1987, 1046/87
Int. Cl.[5] C04B *7/00, 18/18*
U.S. Cl. 106—97 **10 Claims**

1. A method of manufacturing a granular building material being from refuse comprising the steps of:

(a) providing a crushed refuse material substantially free of metallic constituents and containing water;
(b) mixing the refuse material with a mineral material containing calcium oxide in the free or combined state, whereby a first homogeneous powder mixture is formed;
(c) granulating the first powder mixture under pressure;
(d) heating the first granules to between about 130° and 230° C. for a length of time sufficient to reduce their water content to between about 0.1 and 1% by weight;
(e) crushing the first granules to form a granule powder;
(f) mixing the granule powder with hydraulic cement and a quantity of water sufficient to set the cement, whereby a second powder mixture is produced;
(g) granulating the second mixture under pressure; and
(h) allowing the hydraulic cement to set, whereby second granules of a granular building material are produced.

4,919,723

RUTILE MIXED PHASE PIGMENTS WITH IMPROVED COLORISTIC PROPERTIES

Volker Wilhelm, Bergisch-Gladbach, and Manfred Mansmann, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 21, 1988, Ser. No. 273,838
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1987, 3740635
Int. Cl.[5] C04B 31/02
U.S. Cl. 106—441 9 Claims

1. Mixed phase colored pigment which is a combined lithium-containing chromium oxide-antimonyoxide-rutile mixed phase pigment containing from 0.01 to 0.25% by weight of combined lithium.

4,919,724

STABLE AQUEOUS EMULSIONS OF KETENE DIMER/NONREACTIVE HYDROPHOBE

Marco F. Cenisio, Milan, Italy, and Vido J. Vareika, Newark, Del., assignors to Hercules Incorporated, Wilmington, Del.

Filed Jan. 17, 1989, Ser. No. 297,650
Claims priority, application United Kingdom, Jan. 18, 1988, 88001004
Int. Cl.[5] D21D 3/00; C08L 3/00
U.S. Cl. 106—199 13 Claims

1. An aqueous emulsion comprising
(a) ketene dimer having the general formula

$$[RCH{=}C{=}O]_2$$

wherein R is an alkyl radical having from 6 to 22 carbon atoms, a cycloalkyl radical having at least 6 carbon atoms, an aryl, aralkyl or alkaryl radical;
(b) nonreactive hydrophobe is selected from the group consisting of crude and refined paraffin waxes, hydrocarbon resins, terpene resins, synthetic waxes, naturally occurring waxes, fatty acid amides and mixtures thereof; and
(c) stabilizer selected from the group consisting of starch, cationic starch, anionic starch, amphoteric starch, water soluble cellulose ethers, polyacrylamides, polyvinyl alcohol, polyvinyl pyrrolidone and mixtures thereof.

4,919,725

NOVEL DISPERSIBLE ACTIVE SIZING COMPOSITION

Mervyn F. Jones, Bristol, England, assignor to Albright & Wilson Limited, Warley, England

Continuation of Ser. No. 102,773, Sep. 23, 1987, abandoned, which is a continuation of Ser. No. 907,628, Sep. 15, 1986, abandoned. This application Jul. 26, 1988, Ser. No. 225,608
Claims priority, application United Kingdom, Sep. 16, 1985, 8522844
Int. Cl.[5] C08L 89/00
U.S. Cl. 106—218 23 Claims

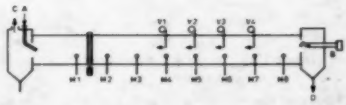
1. In a water dispersible sizing composition consisting essentially of an active sizing agent and an effective proportion of a dispersant therefor, the improvement which consists in using as said dispersant a polyoxalate of a fortified rosin with a polyalkylene glycol in a proportion up to stoichiometric per mole of fortified rosin acid such that the resultant product is essentially free from terminal hydroxyl groups and has a formula $H_{(p-n)}R(X_mR^1)_n$ wherein R is selected from the group consisting of laevopimarate and partially and wholly fortified laevopimarate groups; each X is selected from the group consisting of ethyleneoxy and propyleneoxy groups; R^1 is selected from the group consisting of hydrogen and saturated and unsaturated hydrocarbon and carboxylate groups having from 1 to 20 carbon atoms and such groups optionally substituted with at least one group selected from carboxyl, carboxylic anhydride and hydroxyl groups; v is the average valency of R and has a value of from 1 to 3; n has an average value of from 1 to v; and m has an average value of from 4 to 30.

4,919,726

PROCESS FOR THE PRODUCTION OF RUTILE MIXED-PHASE PIGMENTS

Jakob Rademachers, Krefeld, and Volker Wilhelm, Bergisch-Gladbach, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 18, 1989, Ser. No. 298,382
Claims priority, application Fed. Rep. of Germany, Jan. 28, 1988, 3802469
Int. Cl.[5] C09C 1/36
U.S. Cl. 106—428 12 Claims



1. A process for the production of rutile mixed-phase pigments comprising calcinating of a solid mixture of titanium dioxide or titanium oxide hydroxide with a dye-producing compound of a metal, in one or more directly heated, continuously operated rotary kilns, wherein in terms of material flow, air is introduced into the kiln atmosphere countercurrently to the direction of flow of the solids in the second half of the rotary kiln.

4,919,727

NEW OXIDATION RESISTANT, HEAT RESISTANT IRON OXIDE BLACK PIGMENTS, A PROCESS FOR THEIR PREPARATION AND THEIR USE

Wilfried Barow, Krefeld; Gerd-Hermann Schulten, Duisburg, and Peter Kiemle, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 30, 1989, Ser. No. 303,298
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1988, 3803940
Int. Cl.[5] C04B 14/00
U.S. Cl. 106—456 15 Claims

1. Isometric oxidation resistant and heat resistant iron oxide black pigments having a foreign metal content of less than 5 parts per million of each of As, Pb and Ba.

4,919,728

METHOD OF MANUFACTURING NONMAGNETIC DRILLING STRING COMPONENTS

Heinz Kohl, Ternitz; Helmut Pohl, Neunkirchen, and Alois Püchl, Grimmenstein, all of Austria, assignors to Vereinigte Edelstahlwerke AG (VEW), Vienna, Austria

Continuation-in-part of Ser. No. 866,940, May 27, 1986, abandoned. This application Jul. 15, 1988, Ser. No. 219,216
Claims priority, application Austria, Jun. 25, 1985, 1879/85
Int. Cl.[5] C21D *8/00*
U.S. Cl. 148—12 B 38 Claims

1. A method manufacturing nonmagnetic heavy duty drilling string components for exploratory and directional bores for crude oil and natural gas deposits, comprising the steps of:

melting and allowing to solidify an alloy consisting essentially of, each in percent by weight:

carbon in a maximum of about 0.15;

silicon in a maximum of about 1.0;

manganese about 11.0 to about 25.0;

chromium about 10.0 to about 20.0;

molybdenum about 0.1 to about 1.0;

nickel about 0.1 to about 6.0;

nitrogen about 0.05 to about 0.5;

the remainder being iron and other impurities resulting from manufacturing conditions;

subjecting the alloy to a hot-working operation;

solution heat-treating the alloy at temperatures of about 1,020° C. to about 1,070° C.;

subsequently quenching the alloy;

subjecting the quenched alloy to a cold-working operation at a temperature in the range of above 350° C. to below about 750° C.; and

said step of cold-working said alloy entails cold-working to at least 5% deformation.

4,919,729

SOLDER PASTE FOR USE IN A REDUCING ATMOSPHERE

Peter J. Elmgren, Derry, N.H.; Alan J. Emerick, Warren Center, Pa.; Dennis L. Rivenburg, Sr., Endicott, N.Y.; Mukund K. Saraiya, Endwell, N.Y., and David W. Sissenstein, Jr., Endwell, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 203,965, Jun. 8, 1988, abandoned. This application May 2, 1989, Ser. No. 346,241
Int. Cl.[5] B23K *35/34*
U.S. Cl. 148—24 18 Claims

1. A fluxless solder paste heated in a reducing atmosphere for use in a soldering process comprising:

a solder powder; a binder comprising at least one alcohol, and

said binder having a boiling temperature within the pasty region of a phase diagram of said solder powder,

said boiling temperature being determined by said alcohol, said boiling temperature of said binder reducing splattering associated with said soldering process.

4,919,730

BRAZING PASTE

Howard Mizuhara, Hillsborough, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Filed Jul. 21, 1989, Ser. No. 382,923
Int. Cl.[5] B23K *35/34*
U.S. Cl. 148—24 8 Claims

1. A screening paste comprising a liquid vehicle containing finely dispersed metal powder, the vehicle consisting essentially of hydroxylpropylcellulose and 1,2-propanediol, the paste having leveling characteristics so as to fill gaps resulting from application through a screen.

4,919,731

BRAZING PASTE

Kiyoshi Iyogi; Takaaki Yasumoto, both of Kawasaki; Toshirou Yanazawa, Yokohama; Nobuo Iwase, Kamakura; Masako Nakahashi, and Hiromitsu Takeda, both of Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 154,273, Feb. 10, 1988, Pat. No. 4,835,344. This application Feb. 10, 1989, Ser. No. 308,450
Claims priority, application Japan, Feb. 10, 1987, 62-27122; Apr. 24, 1987, 62-100050; Apr. 24, 1987, 62-100051; May 30, 1987, 62-136265
Int. Cl.[5] B23K *35/34*
U.S. Cl. 148—24 9 Claims

1. A brazing paste, comprising:

(i) metal brazing powder containing at least one of the Group IVa elements;

(ii) 3–15 parts by weight relative to 100 parts by weight of the metal brazing powder of an acrylic binder with a carboxyl group as a substituent group; and

(iii) an organic solvent.

4,919,732

IRON-NEODYMIUM-BORON PERMANENT MAGNET ALLOYS WHICH CONTAIN DISPERSED PHASES AND HAVE BEEN PREPARED USING A RAPID SOLIDIFICATION PROCESS

Choong-Jin Yang, Lowell, and Ranjan Ray, Andover, both of Mass., assignors to Kubota Ltd., Osaka, Japan

Filed Jul. 25, 1988, Ser. No. 223,624
Int. Cl.[5] H01F *1/02*
U.S. Cl. 148—103 2 Claims

1. A method for preparing a fine grained iron-neodymium-boron bulk-shaped alloy comprising the steps of:

forming an alloy melt having the following composition: $Fe_aCo_bNd_cR_dN_eB_f$ wherein Fe, Co, Nd and B are iron, cobalt, neodymium and boron respectively, and R is an element selected from the group consisting of lanthanum, yttrium, cerium, dysprosium, terbium, gadolinium, and praseodymium and mixtures thereof, and N is an element selected from the group consisting of aluminum, silicon, germanium, niobium and gallium and mixtures thereof, wherein a=60–80, B=0–20, c=5–20, d=0–10, e=0–5 and f=3–10 respectively with the proviso that the sum (a+b+c+d+e+f)=100,

adding 0.3 to 3 weight percent of at least one diboride selected from the group consisting of hafnium diboride, zirconium diboride tantalum diboride and titanium diboride, to said melt of alloy,

depositing said melt against a rapidly moving quench surface adapted to quench said melt at a rate in the range of approximately between 10^5° to 10^7° C./second and form a rapidly solidified filament, ribbon or particulate of said alloys characterized predominantly by a single amorphous structure,

comminuting said ribbon, filament or particulate into a powder, said powder having an average particle size of less than 60 mesh and consisting of platelets having a thickness of less than 0.1 millimeter, each platelet being defined by an irregularly shaped outline resulting from fracture,

heat treating said powder by annealing the powder above the crystallization temperature in a vacuum or inert gas atmosphere,

comminuting said heat treated powder under the vacuum or inert atmosphere to provide an ultrafine crystalline powder having an average size of 5 microns or less,

subjecting said ultrafine crystalline powder to cold compaction under an applied magnetic field so that a majority of the crystalline powder becomes oriented so as to allow a large fraction of magnetic domains to be aligned parallel to the direction of the applied magnetic field, and

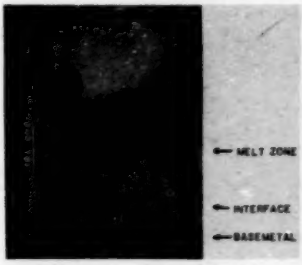
sintering the magnetically aligned powder into a bulk shape.

4,919,733

METHOD FOR REFINING MAGNETIC DOMAINS OF ELECTRICAL STEELS TO REDUCE CORE LOSS

James A. Salsgiver, Sarver; Randal K. Knipe, and Carl P. Stroble, both of Natrona Heights, all of Pa., assignors to Allegheny Ludlum Corporation, Pittsburgh, Pa.

Filed Mar. 3, 1988, Ser. No. 163,448
Int. Cl.[5] H01F *1/04*
U.S. Cl. 148—113 14 Claims



1. A method for improving the core loss properties of an electrical sheet product, the method comprising:

annealing an electrical metal sheet to obtain its magnetic properties;

thereafter subjecting at least one surface of the sheet to an electron beam treatment to produce narrow substantially parallel bands of treated regions separated by untreated regions substantially transverse to the direction of strip manufacture without substantially changing the sheet shape;

the electron beam treatment including generating an electron beam with a voltage of 20 to 200 kilovolts, and providing an energy density sufficient to solely and directly effect a refinement of magnetic domain wall spacing and reduced core loss without damaging the surface, the energy density ranging from about 60 Joules per square inch or more.

4,919,734

COMPRESSED MAGNETIC POWDER CORE

Kumi Ochiai, Yokohama; Hiromichi Horie, Yokosuka; Itsuo Arima, Kawasaki, and Mikio Morita, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 780,303, Sep. 26, 1985, abandoned. This application Sep. 14, 1987, Ser. No. 97,402
Claims priority, application Japan, Sep. 29, 1984, 59-204870; Dec. 27, 1984, 59-274096
Int. Cl.[5] H01F *1/04*
U.S. Cl. 148—306 3 Claims

1. A compressed magnetic powder core comprising a compressed body of an iron-based metallic magnetic powder having an average particle size of not less than 10 μm and not more than 300 μm, each particle surface of said metallic powder having been covered with an insulating layer consisting of a material which is a decomposition product of a metal alkoxide selected from the group consisting of alkoxides of lithium, sodium, potassium, beryllium, magnesium, calcium, strontium, barium, titanium, zirconium, niobium, tantalum, manganese, iron, cobalt, copper, zinc, cadmium, aluminum, gallium, indium, silicon, germanium, tin, lead, arsenic, bismuth, tellurium, yttrium, lanthanum, neodymium, samarium, europium and gadolinium, and a mixture thereof, and is a corresponding metal hydroxide, said insulating layer having a thickness of not more than 10 μm.

4,919,735

KHARE PIPE MOLD STEEL

Ashok K. Khare, Warren, Pa., assignor to National Forge Company, Irvine, Pa.

Filed Dec. 29, 1988, Ser. No. 291,509
Int. Cl.[5] C22C *38/44*
U.S. Cl. 148—334 13 Claims

1. A pipe mold for centrifugally casting pipe formed from a ferritic alloy in weight percentage consisting essentially of from about 0.12% to about 0.22% carbon, about 0.40% to about 0.80% manganese, about 0.025% maximum phosphorus, about 0.025% maximum sulphur, about 0.15% to about 0.40% silicon, about 0.00% to about 0.55% nickel, about 0.80% to about 1.20% chromium, about 0.15% to about 0.60% molybdenum, about 0.03% to about 0.08% vanadium, and balance essentially iron.

4,919,736

ALUMINUM ALLOY FOR ABRASION RESISTANT DIE CASTINGS

Naomi Nishi, and Yosuke Takahashi, both of Tokyo, Japan, assignors to Ryobi Limited, Hiroshima, Japan

Filed Jul. 29, 1988, Ser. No. 226,011
Claims priority, application Japan, Jul. 30, 1987, 62-188744
Int. Cl.[5] C22C *21/02*
U.S. Cl. 148—416 4 Claims

1. An aluminum alloy for abrasion resistant die casts consisting essentially of by weight, 6.0 to 9.0% Cu, 0.5 to 2.0% Mn, 1.6 to 3.0% Fe, 3% or less Mg, together with 13.5 to 20.0% Si, 0.5% or less Ni, inevitable impurities and the remainder being Al, prepared by crystallizing out primary Si crystals of Si and Al-Fe-Mn-Si compounds, and by forming a solid solution with Cu and Mg in the alloy's matrix.

4,919,737

THERMOPLASTIC ELASTOMER-BASED LOW VULNERABILITY AMMUNITION GUN PROPELLANTS

Richard A. Biddle, Elkton, Md., and Rodney L. Willer, Newark, Del., assignors to Morton Thiokol Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 229,032, Aug. 5, 1988. This application Jan. 6, 1989, Ser. No. 294,321
Int. Cl.[5] C06B *45/50*
U.S. Cl. 149—19.5 9 Claims

1. A low vulnerability ammunition gun propellant composition comprising from about 60 to 85 wt. percent of particulates of a high-energy oxidizer and between about 15 wt. percent and about 40 wt. percent of a thermoplastic, elastomeric binder system, said binder system being substantially free of metallic particulates and materials which leave a solid residue, said binder system comprising a non-cross-linked, thermoplastic, elastomeric polymer in which at least one pair of crystalline A

blocks flanks at least one amorphous B block and from 0 to about 80 wt. percent of a plasticizer, wherein said non-cross-linked, elastomeric polymer comprises crystalline polyester A blocks and an amorphous polyether B block.

4,919,738

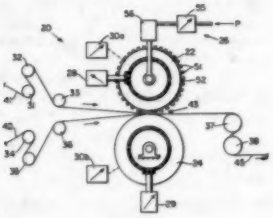
DYNAMIC MECHANICAL BONDING METHOD AND APPARATUS

W. Kenneth Ball; David J. K. Goulait, and James E. Zorb, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 64,896, Jun. 19, 1987, Pat. No. 4,854,984. This application May 25, 1989, Ser. No. 357,373

Int. Cl.[5] **B29C** *65/18;* **B32B** *31/20*

U.S. Cl. 156—73.5 **9 Claims**



1. A method of dynamically bonding plural lamina together, at least one of which laminae comprises thermoplastic material, said method comprising the steps of:

forwarding said laminae at a velocity of about 300 to about 600 per feet minute, with portions thereof in face to face relation, through a pressure biased nip between a relief patterned nip defining member having pattern element segments, and a nip defining anvil member;

biasing said nip defining members towards each other with a predetermined pattern-element loading that is between about 68,000 psi and about 113,000 psi; and

sufficiently heating each said nip defining member to enable dynamically thermobonding said laminae together.

4,919,739

PRODUCTION OF IMPROVED PREIMPREGNATED MATERIAL COMPRISING A PARTICULATE THERMOSETTING RESIN SUITABLE FOR USE IN THE FORMATION OF A SUBSTANTIALLY VOID-FREE FIBER-REINFORCED COMPOSITE ARTICLE

Robert Dyksterhouse; Joel A. Dyksterhouse, both of Marathon, Fla.; Alan C. Handermann, Matthews, N.C., and Edward D. Western, Fort Mill, S.C., assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 928,917, Nov. 7, 1986, abandoned. This application Mar. 3, 1988, Ser. No. 157,836 The portion of the term of this patent subsequent to Jan. 16, 2007, has been disclaimed.

Int. Cl.[5] **B29B** *15/12;* **B29C** *67/14;* **C08J** *5/00*

U.S. Cl. 156—181 **91 Claims**

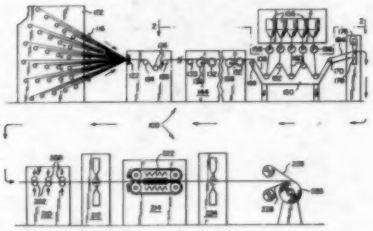
1. A method for the production of an improved fibrous material suitable for the formation of a substantially void-free composite article comprising a plurality of adjoining substantially parallel reinforcing filaments in association with a matrix-forming thermosetting resin comprising:

(a) preparing a dispersion of solid particles of a thermosetting resin in an aqueous medium which contains an effective amount of a dissolved polymeric binding agent,

(b) substantially increasing the viscosity of said dispersion to form an improved impregnation bath whereby the viscosity of the resulting bath becomes at least 50,000 cps. and said impregnation bath has a plastic flow characteristic with shear-thinning behavior which is sufficient to substantially uniformly suspend said particulate thermosetting resin within said bath,

(c) impregnating said adjoining substantially parallel reinforcing filaments with said bath under conditions wherein said bath is caused to flow between said adjoining filaments by the application of work wherein said bath flow inherently results in a reduction of the viscosity of said bath which aids in the incorporation of said particulate thermosetting resin between adjoining filaments, and

(d) controlling the content of said aqueous medium in the resulting fibrous material to provide a product having said



particles of matrix-forming thermosetting resin substantially uniformly dispersed between adjoining filaments in the absence of fusion bonding which inherently (1) is drapable and tacky at ambient conditions, (2) is handleable without segregation of said particles within the fibrous material, and (3) which upon the application of heat and pressure can be transformed into a substantially void-free fiber-reinforced composite article of a predetermined configuration wherein said thermosetting resin becomes substantially completely cured and forms the matrix phase.

4,919,740

METHOD AND APPARATUS FOR FORMING FIN-TYPE BACK SEALS

William D. Kreager, Jr., Dallas, Tex., assignor to Frito-Lay, Inc., Dallas, Tex.

Continuation of Ser. No. 82,415, Aug. 6, 1987, abandoned. This application Mar. 7, 1989, Ser. No. 319,845

Int. Cl.[5] **B32B** *31/14*

U.S. Cl. 156—203 **9 Claims**

1. An apparatus for providing uniform fin-type back seals of flexible packaging material in conjunction with form-fill-and-seal machines of the type that utilize a filling tube, mate the edges of the flexible packaging material, fold the mated edges in one direction against the body of the packaging material, and move the packaging material intermittently through forming and filling stages, the apparatus comprising:

(a) a movable platen having a sealing surface which extends parallel to said filling tube;

(b) a movable tucker plate positioned about parallel to the sealing surface of said platen, pivotally mounted on and supported by said platen, and disposed between the platen and the filling tube, wherein the folded, mated edges of flexible packaging material are disposed between the movable platen and the tucker plate and wherein the body of said packaging material is disposed between the tucker plate and the filling tube;

(c) separation means for maintaining said tucker plate at a fixed distance from said sealing platen when not under sealing pressure; and,

(d) means for applying intermittent sealing pressure so as to rigidly hold said body of said packaging material between said filling tube and said tucker plate, and to compress and seal the mated edges between said tucker plate and said sealing platen.

4,919,741

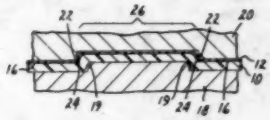
METHOD FOR MAKING EMBOSSED INFORMATION PLATE HAVING RETROREFLECTIVE SHEETING ON THE SURFACE THEREOF

Dennis J. Chirhart, West St. Paul; Michael P. Daniels, Hastings, and Kenneth G. Kneipp, Maplewood, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 99,641, Sep. 23, 1987, abandoned, which is a continuation-in-part of Ser. No. 844,532, Jul. 11, 1986, abandoned. This application Mar. 3, 1989, Ser. No. 318,737

Int. Cl.[5] B31F *1/00*; B32B *31/00*

U.S. Cl. 156—223 **25 Claims**



1. A method for producing an information plate having desired indicia embossed on the front surface thereof in relief fashion and having a reflective sheeting adhered to the background portions of said front surface, wherein said method comprises:

(1) tacking a reflective sheeting comprising a low-tack, heat-activated adhesive on the back side thereof to the front surface of a plate blank, the surface of said plate blank being essentially planar in the interior regions thereof;

(2) embossing said plate blank and reflective sheet according to said indicia with a dual-die press, wherein a male die is pressed to the back surface of said blank, and a female die is pressed to the front surface of said blank upon which said reflective sheeting is tacked, said female die being adapted to shear said reflective sheet along the contours of said indicia, whereby said reflective sheeting is cut out along the relief outline of said indicia;

(3) removing the cut-out portions of said reflective sheeting from said indicia; and

(4) moving said embossed plate and the trimmed reflective sheeting which is tacked thereto through a series of at least two pairs of co-acting, resilient lamination rollers, wherein the roller of each pair which contacts the front surface of said plate is heated with heating means, whereby said adhesive is activated and effectively wets the surface of said plate and said reflective sheeting is laminated to the front surface of said plate.

4,919,742

METHOD FOR MANUFACTURING A LID FOR CLOSING A CONTAINER COMPRISING A THERMOPLASTIC MATERIAL SEALING ZONE

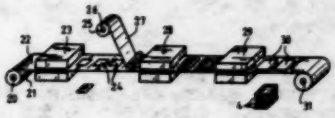
Robert A. Rebischung, Selestat, France, assignor to Societe Alsacienne d'Aluminium, France

Division of Ser. No. 195,871, May 19, 1988, Pat. No. 4,830,215. This application Mar. 23, 1989, Ser. No. 328,093

Claims priority, application France, May 20, 1987, 87 07077

Int. Cl.[5] B32B *31/18*

U.S. Cl. 156—269 **2 Claims**



1. A method for manufacturing a lid for closing a container having a thermoplastic material sealing zone defined by an inner and outer edge, said lid having a layer of closure material, a varnish applied to one face of the closure material and a thermoplastic material layer fixed to and covering at least a part of the varnish which is intended to face the sealing zone of the container to be closed, comprising successively forming in a strip of thermoplastic material a series of openings whose periphery corresponds substantially to the inner edge of the sealing zone of the containers, thereafter fixing a closure material strip having a layer of varnish on one side thereof on one side of the thermoplastic material strip with the varnish lying adjacent the thermoplastic material strip and cutting out from the complex thus obtained a series of the lids whose periphery corresponds substantially to the outer edge of the sealing zone of the containers, the lids being formed so that the openings are closed by the closure material.

4,919,743

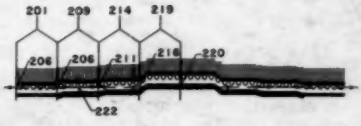
METHOD OF LAYING CARPET TO AVOID SEAM PEAKING AND APPARATUS THEREFOR

Wayne R. Johnston, 1114 Harwich Dr., San Marcos, Calif. 92069, and Alan G. Johnston, #8 Spencer Dr., Nashua, N.H. 03062

Continuation-in-part of Ser. No. 819,804, Jan. 16, 1986, Pat. No. 4,749,433. This application Nov. 23, 1987, Ser. No. 123,781

Int. Cl.[5] B29C *65/18*, *65/50*

U.S. Cl. 156—304.4 **14 Claims**



1. A method for laying multiple layer, tufted carpet to substantially reduce seam peaking which tends to occur in such carpeting after abutting edges of the carpet are secured together by means of hot-melt adhesive coated normal seaming tape normally having a width of approximately three inches and the carpet is finally stretched, said method comprising the steps of:

cutting and fitting the carpet to the floor area with two abutting carpet edges forming a carpet seam;

laying a hot-melt adhesive coated enhanced width seaming tape beneath said carpet seam, said enhanced width seaming tape being configured with its composite modulus of elasticity varying laterally across its width, said enhanced width seaming tape having a width of approximately

twice the width of said normal seaming tape, said enhanced width seaming tape underlying the carpet sections substantially equally on either side of said seam, there being meltable adhesive on the side of said enhanced width seaming tape facing upward and engaging the carpet at said carpet seam;

heating the adhesive on said enhanced width seaming tape with a carpet seaming iron of a width sufficient to simultaneously heat the full width of said enhanced width seaming tape to make the adhesive molten;

forcing the adjacent carpet edges down onto the molten adhesive side of said enhanced width seaming tape; and

then stretching the carpet to the floor periphery in conventional manner.

4,919,744

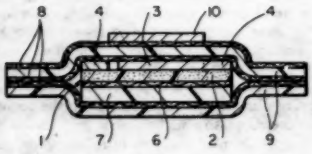
METHOD OF MAKING A FLEXIBLE HEATER COMPRISING A CONDUCTIVE POLYMER

Keith G. Newman, Sunnyvale, Calif., assignor to Raychem Corporation, Menlo Park,, Calif.

Filed Sep. 30, 1988, Ser. No. 252,237

Int. Cl.[5] B32B *31/20*

U.S. Cl. 156—308.2 **14 Claims**



1. A method of laminating layers to form a heater comprising a conductive polymer heating element, said method comprising

(A) positioning a layer of nonwoven cloth between (1) a first layer which (a) comprises a laminar heating element which exhibits PTC behavior and which comprises a conductive polymer composition and (b) further comprises at least two electrodes which are positioned so that when current passes between the electrodes a substantial proportion of the current through the laminar element is parallel to the faces of the laminar element and (2) a second layer which comprises a polymeric insulating material; and

(B) exposing the layers to sufficient temperature and pressure to achieve a bond between the layers.

4,919,745

APPARATUS AND METHOD FOR PLASMA TREATMENT OF RESIN MATERIAL

Kenji Fukuta; Takaoki Kaneko, and Yoshinobu Takahashi, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Division of Ser. No. 817,115, Jan. 8, 1986, abandoned, which is a division of Ser. No. 772,208, Sep. 5, 1985, abandoned, which is a continuation of Ser. No. 583,181, Feb. 24, 1984, abandoned. This application Feb. 8, 1989, Ser. No. 307,509

Claims priority, application Japan, Feb. 25, 1983, 58-29371; Feb. 25, 1983, 58-29372; Mar. 10, 1983, 58-38204

Int. Cl.[5] C23C *16/50*; **B01J** *19/08*

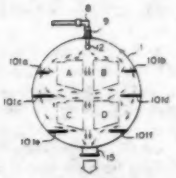
U.S. Cl. 156—345 **3 Claims**

1. An apparatus providing a substantially uniform density of microwave discharge plasma on resinous objects comprising:

a reaction chamber having an inner wall and a plurality of ports spaced along said inner wall;

a pair of disc plates for rotation about a common axis, said pair of disc plates being horizontally spaced and vertically aligned;

mounting members for supporting said objects, said mounting members being rotatably mounted on said pair of disc plates to rotate about said common axis and to rock freely about independent axes of each of said mounting members;



injecting means for injecting said plasma into said reaction chamber, and

diffusing means mounted on said inner wall for diffusing said injected plasma within said reaction chamber to distribute a uniform density of plasma on exterior surfaces of said objects, said diffusing means including a plurality of deflecting plates mounted along said inner wall.

4,919,746

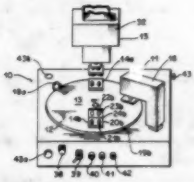
APPARATUS FOR BONDING A LOW DENSITY MATERIAL TO A PLASTIC SUBSTRATE

Wayne M. Celia, 242 Purdue Ct., Paramus, N.J. 07652

Division of Ser. No. 206,709, Jun. 15, 1988, Pat. No. 4,854,993, which is a division of Ser. No. 97,655, Sep. 17, 1987, Pat. No. 4,794,030. This application Feb. 10, 1989, Ser. No. 308,532

Int. Cl.[5] B32B *31/16*

U.S. Cl. 156—359 **8 Claims**



1. An apparatus for bonding a low density material to a thermoplastic plastic substrate comprising,

a. a base;

b. a rotary turntable rotatably connected to the base;

c. at least one workpiece holder on the turntable to secure at least one thermoplastic plastic substrate to the turntable;

d. a conductive heating assembly including,

i. at least one descendible and retractable welding iron for contacting the plastic substrate,

ii. a heating element for heating said at least one welding iron to a predetermined temperature; and

iii. means for actuating the descending movement of the at least one welding iron to melt the plastic substrate only at the points of contact;

e. a compression assembly including at least one descendible and retractable compression platen to emboss the low density material into the melted areas of plastic;

f. means for controlling the rotation of the turntable; and

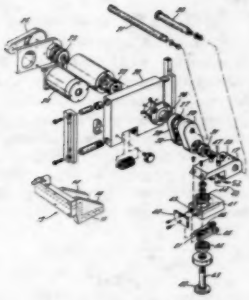
g. means for controlling the descending and retracting movement of the at least one welding iron and at least one compression platen.

4,919,747

LABEL APPLYING DEVICES FOR APPLYING ADHESIVE LABELS TO ARTICLES

Christopher R. Eagle, Harwich, United Kingdom, assignor to Portals Engineering Limited, Harwich, United Kingdom

Filed Nov. 15, 1988, Ser. No. 271,315
Int. Cl.[5] B65C 9/14, 9/28
U.S. Cl. 156—497 7 Claims



1. A label applying device for applying adhesive labels to articles comprising; label holding means, means to supply labels one-by-one to the holding means oriented in one direction, a pad having a surface to receive a label, means to draw vacuum at the surface to hold a label on the surface and means to apply air pressure to the surface to propel the label from the pad onto a surface of an article, reciprocating support means to support the pad and to move the pad between a label receiving position adjacent the label holding means to receive a label to a label discharging position to discharge a label onto an article and means to rotate the pad with respect to the support means through a predetermined angle about an axis extending normal to the surface of the pad to enable a label received from the holding means to be positioned in the required orientation on said article, wherein the means to rotate the pad comprise a spindle having the pad mounted at one end thereof and mounted for rotation on the support means about an axis extending longitudinally of the spindle, pneumatically operated ram means drivingly engaged with the spindle to rotate the spindle in either direction about said axis and thereby re-orient a label received on the pad before delivering the label at said discharging position, said pneumatically operated ram means for rotating the spindle including a pair of pneumatically operated racks mounted in the support means, and a pinion provided on the spindle with which the racks are in driving engagement to rotate the spindle and with it the pad in opposite directions.

4,919,748

METHOD FOR TAPERED ETCHING

Craig N. Bredbenner, Lehighton, Pa.; Troy A. Giniecki, South Plainfield, N.J.; Nur Selamoglu, Philadelphia, Pa., and Hans J. Stocker, Austin, Tex., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

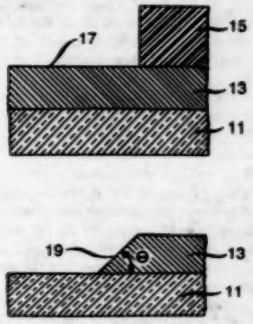
Filed Jun. 30, 1989, Ser. No. 374,408
Int. Cl.[5] C23F 1/02; B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—643 6 Claims

1. A method of semiconductor device fabrication comprising:

forming a first layer upon a substrate;

forming a second layer containing aluminum upon said first layer;

etching both said first and said second layer with a gas mixture, characterized in that said gas mixture contains



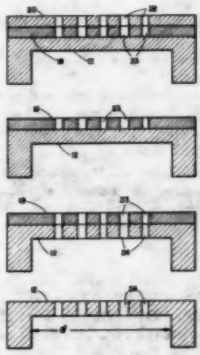
chlorine and trifluoromethane and said etching step produces a tapered profile.

4,919,749

METHOD FOR MAKING HIGH RESOLUTION SILICON SHADOW MASKS

Philip E. Mauger, Santa Clara; Alex R. Shimkunas, Palo Alto, and Junling J. Yen, Cupertino, all of Calif., assignors to Nanostructures, Inc., Mountain View, Calif.

Filed May 26, 1989, Ser. No. 357,481
Int. Cl.[5] H01L 21/306; B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—643 28 Claims



1. A method of forming a silicon shadow mask having a pattern of etched through apertures comprising the steps of:

(a) forming a silicon membrane having a selectively controlled predetermined stress characteristic and a thickness of less than approximately 25 microns;

(b) applying a masking layer to an upper surface of said silicon membrane;

(c) patterning said masking layer with a pattern corresponding to said pattern of etched through apertures;

(d) etching away said masking layer in regions corresponding to said pattern of etched through apertures;

(e) etching away said silicon membrane in said regions corresponding to said pattern of etched through apertures, thereby creating said etched through apertures;

(f) removing remaining portions of said masking layer.

4,919,750

ETCHING METAL FILMS WITH COMPLEXING CHLORIDE PLASMA

Robert C. Bausmith, Glastonbury, Conn.; William J. Cote, Essex Junction, Vt.; John E. Cronin, Milton, Vt.; Karey L. Holland, Essex, Vt.; Carter W. Kaanta, Colchester, Vt.; Pei-Ing P. Lee, and Terrance M. Wright, both of Williston, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 96,578, Sep. 14, 1987, abandoned. This application Apr. 24, 1989, Ser. No. 342,616

Int. Cl.[5] C23F *1/00*; H01L *23/306*

U.S. Cl. 156—643 7 Claims

1. A method of etching a surface of a layer made up of a metal M or an alloy having the metal M as its majority component by weight percent. the metal M being selected from the group consisting of cobalt, copper, or nickel, said layer being disposed on a workpiece positioned within a RIE reaction chamber, comprising the steps of inserting the workpiece into the RIE reaction chamber and exposing the layer to a reactive ion etch in a chlorine-based plasma in the presence of a source of a metal Z spaced apart from the workpiece to provide Z-Cl gaseous reaction products which serve as the principal complexing agent with said cobalt, copper, or nickel to form volatile M-based M-Z-Cl reaction products and continuing said exposure until said layer is etched by the removal of M-Z-Cl based reaction products formed during the reactive ion etching.

4,919,751

METHOD FOR PRODUCING POROUS SINTERED APATITE MATERIAL

Masaya Sumita, and Hitoshi Akiyama, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 1, 1989, Ser. No. 304,446

Claims priority, application Japan, Feb. 1, 1988, 63-21691; May 31, 1988, 63-134188

Int. Cl.[5] B44C *1/22*; C03C *15/00, 25/06*; C04B *35/00*

U.S. Cl. 156—646 11 Claims

1. A method for producing a porous sintered apatite material comprising the steps of:

sintering a calcium-excess apatite at a temperature of at least 800° C. so as to form a sintered apatite material having a calcium oxide content of from 0.5 to 60 wt % by phase separation of calcium oxide; and

removing said calcium oxide from said sintered apatite material by contacting the sintered apatite material with a liquid or a vapor so as to form a porous sintered apatite material.

4,919,752

BATH SOLUTION AND PROCESS FOR THE REMOVAL OF LEAD/TIM, LEAD OR TIN COATINGS FROM COPPER OR NICKEL SURFACES

Gunter Mika, Geldern, Fed. Rep. of Germany, assignor to Koll-morgen Corporation, Simsbury, Conn.

Filed Nov. 10, 1988, Ser. No. 269,582

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1987, 3738307

Int. Cl.[5] C23F *1/00*; B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—656 12 Claims

1. Process for the removal of lead/tin, lead or tin coatings applied to nickel or copper surfaces, by contacting the coatings with an aqueous stripping solution for a period sufficient to remove the coatings from the nickel or copper surfaces, said aqueous stripping solution being characterized in that the stripping solution contains nitric acid and one or several inhibitor(s) selected from the group of block copolymers of propylene oxide and ethylene oxide, fluorocarbon surfactants, polyethylene glycols with a molecular weight more than 2000, and polyols.

4,919,753

NONWOVEN FABRIC-LIKE PRODUCT USING A BACTERIAL CELLULOSE BINDER AND METHOD FOR ITS PREPARATION

Donald C. Johnson, Auburn, and Amar N. Neogi, Seattle, both of Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Continuation of Ser. No. 849,982, Apr. 10, 1986, abandoned. This application Jan. 23, 1989, Ser. No. 299,691

Int. Cl.[5] D21H *5/12*

U.S. Cl. 162—116 20 Claims

1. A method of bonding a fibrous wet laid nonwoven paper or fabric-like product which comprises adding to the fibers thereof as a binder prior to wet forming the product a minor portion of an aqueous dispersion of a bacterial cellulose essentially free of bacterial cells, said bacterial cellulose having a reticulated structure formed by a substantially continuous network of branching interconnected cellulose strands, said bacterial cellulose being produced by a microorganism of the genus Acetobacter cultured under agitated aerobic conditions, said microorganism being selected from a stable strain resistant to mutation to non-cellulose producing types under said culturing conditions.

4,919,754

COMPOSITION WHEREIN RECYCLED CELLULOSIC PULP IS DEINKED

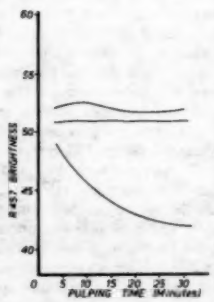
Christopher C. Mollett, Brighton, and Gordon R. Sneddon, Farncombe, both of England, assignors to Albright & Wilson Limited, Warley, United Kingdom

Division of Ser. No. 731,527, May 7, 1985, abandoned. This application Mar. 18, 1987, Ser. No. 28,017

Claims priority, application United Kingdom, May 10, 1984, 8411888; Aug. 24, 1984, 8421546

Int. Cl.[5] D21C *5/02*

U.S. Cl. 162—5 20 Claims



1. A composition comprising:

(i) an aqueous, recycled cellulosic fibre pulp;

(ii) print pigments contaminating said pulp;

(iii) dispersed in said contaminated pulp, from 0.1% to 10% based on the weight of the pulp solids of a curable precursor of a solid polymer resin which is not substantive to the cellulosic fibres of said pulp; and

(iv) a catalyst capable of curing said precursor in said dispersion; wherein

(a) said resin precursor consists essentially of a mixture of a fluid prepolymer having at least two reactive functional groups per molecule and a cross-linking agent capable of reacting with said functional groups;

(b) said catalyst is present in an amount effective to cure said resin precursor in said dispersion and thereby to form agglomerates comprising cured resin and at least some of said contaminating pigment; and

(c) said agglomerates can be separated from said dispersion to effect deinking of said pulp.

4,919,755

PROCESS FOR BLEACHING

Inge Mansson, Kungälv, Sweden, assignor to Eka Nobel AB, Sweden

PCT No. PCT/SE88/00320, § 371 Date Feb. 13, 1989, § 102(e) Date Feb. 13, 1989, PCT Pub. No. WO88/10334, PCT Pub. Date Dec. 29, 1988

PCT Filed Jun. 14, 1988, Ser. No. 317,473

Claims priority, application Sweden, Jun. 24, 1987, 8702616

Int. Cl.[5] D21C *3/04*

U.S. Cl. 162—83 16 Claims

1. Process for bleaching of materials with a dithionite solution, characterised in that an aqueous borohydride solution containing borohydride corresponding to from 15 to 35 percent by weight of sodium borohydride and containing hydroxylic ions corresponding to not more than 10 percent by weight of NaOH is brought to react with a bisulfite solution, after which the dithionite solution thus obtained is added to the material to be treated.

4,919,756

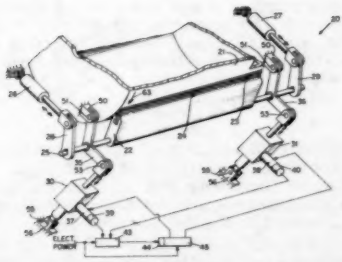
METHOD OF AND APPARATUS FOR COMPENSATINGLY ADJUSTING DOCTOR BLADE

Albert H. Sawdai, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 26, 1988, Ser. No. 236,951

Int. Cl.[5] D21G *3/00*

U.S. Cl. 162—111 6 Claims



1. A method of reducing deleterious effects of doctor blade wear on material impacting the doctor blade in an apparatus wherein the doctor blade is so mounted that doctor blade wear progressively precipitates change in the impact angle of the doctor blade and a directly related change in a physical property of said material, said method comprising the steps of:

a. empirically ascertaining a time rate of change function of said impact angle of said doctor blade due to progressive wear of said doctor blade;

b. empirically ascertaining the functional relation between said impact angle of said doctor blade and said physical property of said material; and

c. continually adjusting the angular position of the doctor blade in accordance with said function and said functional relation to substantially reduce the deleterious effect on said physical property of said material which would otherwise be precipitated by doctor blade wear.

4,919,757

AQUEOUS DISPERSION OF CATIONIC POLYMER

Tadayuki Ohmae; Kentaro Mashita; Noboru Yamaguchi; Kouichiro Asao, all of Chiba; Norio Kondo, Osaka, and Tadashi Sakurai, Chiba, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

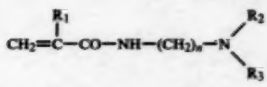
Division of Ser. No. 119,448, Nov. 12, 1987. This application Aug. 26, 1988, Ser. No. 236,809

Claims priority, application Japan, Nov. 11, 1986, 61-268900

Int. Cl.[5] D21H *3/36*

U.S. Cl. 162—164.3 4 Claims

1. Paper obtained by adding to a pulp slurry an aqueous dispersion of a cationic polymer obtained by reacting an ethylene copolymer comprising from 40 to 80% by weight of ethylene and from 20 to 60% by weight of at least one aminoalkyl acrylamide comonomer represented by formula (I):



(I)

wherein R_1 represents a hydrogen atom or a methyl group; R_2 and R_3 each represents a hydrogen atom or an alkyl group having from 1 to 4 carbon atoms; and n represents an integer of from 2 to 4, and having a melt index, as measured in accordance with JIS K-6760, of from 10 to 1,000 g/10 min with hydrochloric acid in water to from a quaternary salt and subsequently reacting the resulting quaternary salt with an epihalohydrin compound through addition reaction, and drying, wherein at least 50 parts by mole of the epihalohydrin compound is used per 100 parts by mole of the amino group in the ethylene copolymer.

4,919,758

HEAT TREATMENT OF PAPER PRODUCTS HAVING STARCH ADDITIVES

Dinkar G. Wagle, Monroe, and Vacheslav M. Yasnovsky, Orangeburg, both of N.Y., assignors to International Paper Company, Purchase, N.Y.

Continuation-in-part of Ser. No. 768,784, Aug. 23, 1985, abandoned. This application Sep. 30, 1987, Ser. No. 102,699

The portion of the term of this patent subsequent to Apr. 4, 2006, has been disclaimed.

Int. Cl.[5] D21H *3/28*

U.S. Cl. 162—175 2 Claims

1. A method of improving the stiffness and wet strength of a kraft paper product comprising steps of:

incorporating a starch preparation consisting essentially of starch in aqueous solution into the paper product, the amount of starch added being in the range of 0.2% to 10% the weight of the paper product,

adjusting the moisture content of the paper product to within the range of 1% to 20% by weight,

heat treating said paper product at a temperature in the range of 284° F. to 482° F. for a period of time in the range of 0.5 to 120 seconds, and then

applying water to the product while the product remains at a temperature above 212° F., immediately after the heat treating step, to produce a final moisture content in the range of 1% to 20% by weight of the paper product.

4,919,759

CONTROL OF DETACHMENT OF A PAPER WEB FROM A ROLL USING HEAT

Antti Ilmarinen; Veijo Miihkinen, both of Jyväskylä, and Jorma Laapotti, Palokka, all of Finland, assignors to Valmet Paper Machinery Inc., Finland

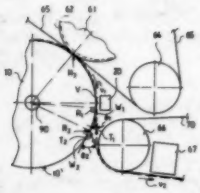
Filed Jan. 25, 1988, Ser. No. 147,457

Claims priority, application Finland, Jan. 23, 1987, 870308

The portion of the term of this patent subsequent to Dec. 26, 2006, has been disclaimed.

Int. Cl.[5] D21F *3/02*

U.S. Cl. 162—206 **23 Claims**



1. Method for detaching a moist paper web from a roll, comprising the steps of

detaching the web from said roll,

adjusting temperature of a surface of said roll, whereby adhesion between said web and said roll surface is affected, and

setting at least one of a detaching angle of said web off said roll and detaching tension of said web as a result of said temperature adjustment,

comprising the additional steps of

pre-selecting at least one of said detaching tension and detaching angle,

then determining at least one of surface tension and viscosity of water in the web,

then selecting desired temperature of said roll surface based upon at least one of said determined viscosity and surface tension, and

then carrying out said temperature adjustment step, whereby at least one of said detaching tension and angle are set.

4,919,760

WEB FORMER FOR A PAPER MACHINE

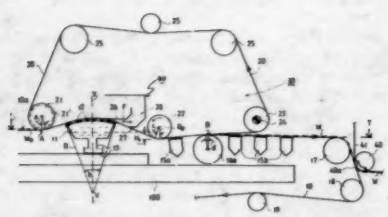
Reima Kerttula, Charlotte, N.C., assignor to Valmet Paper Machinery Inc., Finland

Filed Jul. 13, 1988, Ser. No. 218,833

Claims priority, application Finland, Jul. 13, 1987, 873076

Int. Cl.[5] D21F *1/36*

U.S. Cl. 162—300 **27 Claims**



1. A web former for a paper machine, comprising a combination of

a lower wire loop forming an initial single wire part of a dewatering zone on which water is removed through the lower wire out of a web being formed by at least one dewatering member,

an upper wire unit including an upper wire loop guided by guide rolls and a web-forming roll,

the upper and lower wires forming a twin-wire part of the dewatering zone in which dewatering takes place substantially upwardly through the upper wire, and the web-forming roll being a first forming roll in a direction of web run, being provided with an open hollow face, and being fitted inside the upper wire loop,

the twin-wire dewatering zone part beginning at the first forming roll and curving upwardly over a sector of this roll,

a forming shoe fitted inside the lower wire loop and after the first forming roll in the web run direction, and guiding the twin-wire dewatering zone part,

the forming shoe having a curved deck for guiding the lower wire loop with a center of curvature situated on a side of the lower wire loop,

a second forming roll fitted inside the upper wire loop and after the forming shoe in the web run direction, and guiding the twin-wire part over a sector thereof, a lowest point of which is situated at a lower level than a level of the initial, single-wire dewatering part,

a guide roll situated inside the lower wire loop after said second forming roll and guiding the twin-wire part over a sector of said guide roll to substantially the level of the initial, single-wire dewatering zone,

means for collecting water being fitted inside the upper wire loop and between said forming shoe and second forming roll, said means operating without any external suction source and the water collecting thereof being based upon at least one of kinetic energy of water being removed and gravity, and

said twin-wire part being arranged over said first and second forming rolls and said forming shoe therebetween, to effect dewatering in two directions over said sector of said first forming roll through both the upper and lower wires, both upwardly and downwardly over the curved deck of said forming shoe, and reversing principal dewatering direction of said shoe over said sector of said second forming roll, with dewatering pressure being increased thereat, after the initial dewatering has taken place through the lower wire on the initial single-wire part to an appropriate extent.

4,919,761

LONG NIP PRESS ROLL WITH INTERNAL LINE COUPLINGS AT BOTH AXIAL ROLL ENDS

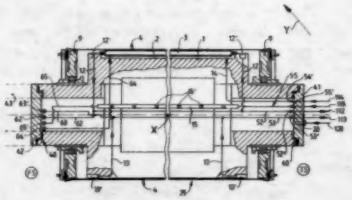
Christian Schiel; Hans Flämig, both of Heidenheim, and Andreas Schütte, Steinheim, all of Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Sep. 22, 1989, Ser. No. 411,407

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1988, 3832324

Int. Cl.[5] D21F *3/08*

U.S. Cl. 162—358 **11 Claims**



1. A long nip press roll comprising:

a stationary support member; two axially spaced apart sup-

porting discs mounted for rotation on the support member;

a press shoe disposed on and supported on the support member, and means in the support member for displacing the press shoe radially parallel to the press plane of the press roll and against another counter roll;

a flexible, tubular, inflatable press shell extending around the support member, affixed to the supporting discs and extending around the press shoe for forming an areal press nip between the exterior of the press shell at the press shoe and the counter roll in the press plane for treating a web to be passed through the nip;

the press roll having opposite axial ends; the press roll further having respective internal lines located between the axial ends of the roll for at least some of the supply and discharge of pressure oil, for lubricating and cooling oil, and for compressed air for pressurizing the press shell;

each internal line having one of a first set of corresponding couplings for receiving a respective external line located outside one axial end of the press roll, the first set of couplings being located at one axial end of the press roll; each internal line having one of a second set of corresponding couplings for receiving a respective external line located outside the other axial end of the press roll, the second set of couplings being located at the other axial end of the press roll, the couplings providing connections from the internal lines to the respective external lines.

4,919,762

PRESS SECTION AND PRESS SECTION/FRAME CONSTRUCTION COMBINATION IN A PAPER MACHINE

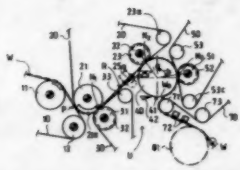
Jorma Laapotti, Palokka, and Olli Tapio, Jyväskylä, both of Finland, assignors to Valmet Paper Machinery Inc., Finland

Filed Jun. 17, 1988, Ser. No. 209,080

Claims priority, application Finland, Jun. 17, 1987, 872693

Int. Cl.[5] D21F *3/04*

U.S. Cl. 162—360.1 **20 Claims**



1. A press section-frame construction combination in a paper machine, said paper machine including a forming section having a forming wire, comprising:

a first upper fabric;

a pick-up press-suction roll within a loop of said first upper fabric situated proximate to a run of the forming wire for transferring a web from the forming wire onto said first upper fabric;

a first lower fabric;

a first lower press roll within a loop of said first lower fabric situated in nip-defining relationship with said pick-up suction roll to form a first double-felted press nip;

a smooth-surfaced center roll;

a second press roll situated within the loop of said first upper fabric situated in nip-defining relationship with said center roll to form a second single-felted nip directly, consecutively following said first double-felted nip and through which only said first upper fabric passes;

said upper fabric having a substantially straight upwardly inclined run between said first double-felted nip and said second single-felted nip;

a frame construction on which said pick-up press-suction roll, said first and second press rolls, and said center roll are mounted, and wherein

the web is transferred by said pick-up press-suction roll from the forming wire onto said first upper fabric and is carried on lower surface of said first upper fabric into said first double-felted nip wherein the web is dewatered through both of its faces, whereupon the web is carried supported on said first upper fabric over said substantially straight run into said second, single-felted nip whereupon the web separates from said first upper fabric and is carried on the surface of said smooth-surfaced center roll,

a third press roll mounted on said frame construction and situated in nip-defining relationship with said center roll to form a third single-felted nip;

a second upper fabric passing through said third single-felted nip, wherein

after separation from said first upper fabric, the web is carried on the surface of said smooth-surfaced center roll into said third single-felted nip, and

wherein said second nip is located at a point above a horizontal plane passing through an axis of rotation of said center roll and on a side of a vertical plane passing through an axis of rotation of said center roll closer to said first nip, and wherein said third nip is located on the opposite side of said vertical plane.

4,919,763

APPARATUS FOR CONVERTING SEWAGE SLUDGE FILTER CAKE BY PYROLYSIS

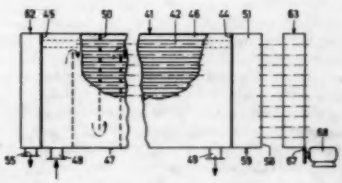
Klaus-Jürgen Hinger, Stuttgart, Fed. Rep. of Germany, assignor to Werner & Pfleiderer GmbH, Fed. Rep. of Germany

Filed Jul. 15, 1987, Ser. No. 73,816

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1986, 3624877; May 29, 1987, 3718133

Int. Cl.[5] C10B *1/02, 1/06*

U.S. Cl. 202—113 **12 Claims**



1. An apparatus for converting sewage-sludge filter cakes to coke by pyrolysis which comprises a comminuter, a preliminary evaporating means, a residual evaporating means and a coke converting means, each of said preliminary evaporating means, said residual evaporating means, and said coke converting means being constructed with at least one module;

each of said modules having walls to define a central heat transfer tube chamber, a transfer chamber connected to the tube chamber at one end of the tube chamber and an upper feed chamber and a lower delivery chamber connected to the tube chamber at the other end of the tube chamber;

a plurality of first tubes and a plurality of second tubes mounted in and extending through said tube chamber, each first and second tubes having a first end and a second end, said first ends of said first tubes connected to and opening into said transfer chamber, said second ends of said first tubes connected to and opening into said upper feed chamber;

said first ends of said second tubes connected to and opening into said transfer chamber, said second ends of said second tubes connected to and opening into said lower delivery chamber;

a first coreless screw conveyor member mounted in each of

said first tubes to deliver material by said first tubes from said upper feed chamber to said transfer chamber;

a second coreless screw conveyor member mounted in each of said second tubes to deliver material by said second tubes from said transfer chamber to said delivery chamber; wherein said first and second tubes mounted in and extending through said tube chamber are spaced apart so as to permit passage of a heat transfer medium around said first and second tubes to provide heat exchange between the medium and said first and second tubes, and said tube chamber includes a heat transfer medium inlet and a heat transfer medium outlet.

4,919,764

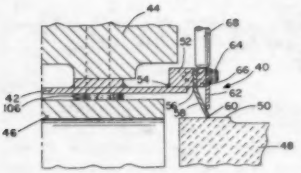
RETROFIT COKE OVEN DOOR SEAL

William R. Baird, and Billy C. Baird, both of Sturgis, Ky., assignors to Saturn Machine & Welding Co., Inc., Sturgis, Ky.

Filed Feb. 13, 1989, Ser. No. 309,223

Int. Cl.[5] C10B *25/16*

U.S. Cl. 202—248 **3 Claims**



1. A retrofit coke oven door seal assembly in combination with a coke oven door having a diaphragm plate supported from a door body, said plate having an interior surface with refractories supported therefrom and a peripheral edge, said seal assembly comprising a support member mounted peripherally around the peripheral edge of the diaphragm plate, a pressure leaf spring and a seal attached to the support member for engagement with a door jamb surface peripherally of the coke oven door, said seal including an angled portion for engaging a door jamb surface in angular relation to enable flexing of the angled portion without maintaining the plane of the angled portion while maintaining sealing engagement with a door jamb, said angled portion including an inclined outer surface, said pressure leaf spring including an edge engaging the outer surface of the angled portion of the seal to provide continual pressure against the angled portion of the seal, said coke oven door including plungers engaging the seal assembly and providing pressure against the seal assembly, said pressure leaf spring being straight throughout its length and width, said seal and pressure leaf spring having parallel opposed surfaces spaced from each other, a spacer bar positioned between and engaged with the opposed surfaces on said seal and pressure leaf spring, and fastener bolts extending through the seal, pressure leaf spring and spacer bar into the support member to removably secure the seal, pressure leaf spring and spacer bar to the support member.

4,919,765

PROCESS FOR THE PURIFICATION OF TETRAHYDROFURAN

Peter R. Wilkes, Rickmansworth; John Scarlett, Spennymoor, and George E. Harrison, Billericay, all of England, assignors to Davy McKee (London) Limited, London, England

Filed Jul. 22, 1988, Ser. No. 222,727

Claims priority, application United Kingdom, Jul. 29, 1987, 8717993

Int. Cl.[5] B01D *3/34*

U.S. Cl. 203—64 **18 Claims**

1. A continuous process for the separation of tetrahydrofuran from a crude reaction product containing, in addition to tetrahydrofuran, ethanol, water, and n-butanol, and high boiling materials including butane-1,4-diol and gamma-butyrolactone, which process comprises:

(a) supplying the crude reaction product to a first distillation zone;

(b) recovering a vaporous first overhead product from the first distillation zone containing tetrahydrofuran, ethanol and water;

(c) redistilling the overhead product from the first distillation zone in a second distillation zone;

(d) supplying to an upper part of the second distillation zone a hydroxylic solvent containing at least two hydroxyl groups;

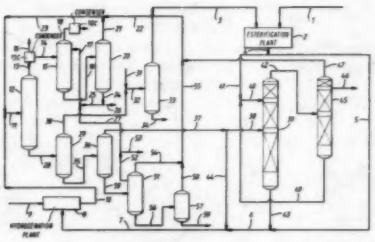
(e) recovering an overhead product from the second distillation zone consisting essentially of tetrahydrofuran;

(f) recovering a bottom product from a lower part of the second distillation zone comprising hydroxylic solvent, tetrahydrofuran, ethanol and water;

(g) stripping tetrahydrofuran, ethanol and water from the bottom product of step (f) by distillation in a third distillation zone; and

(h) recycling stripped bottom product of step (g) to the second distillation zone.

12. A continuous process for the separation of tetrahydrofuran in a distillation plant from a crude reaction product containing, in addition to tetrahydrofuran, dissolved hydrogen, ethanol, water and n-butanol, and high boiling materials including butane-1,4-diol and gamma-butyrolactone, which process comprises:



(i) supplying the crude reaction product to a first distillation zone which is operated substantially at atmospheric pressure;

(ii) recovering a vaporous first overhead product from the first distillation zone containing hydrogen, tetrahydrofuran, ethanol and water;

(iii) cooling said vaporous first overhead product to effect separation by condensation of a first condensate from a gaseous stream containing hydrogen, said first condensate containing tetrahydrofuran, ethanol and water;

(iv) purging the gaseous stream of step (iii) from the distillation plant;

(v) redistilling the first condensate in a second distillation zone which is operated substantially at atmospheric pressure;

(vi) supplying to an upper part of the second distillation zone a hydroxylic solvent containing at least two hydroxyl groups;

(vii) recovering a second overhead product from the second distillation zone consisting essentially of tetrahydrofuran;

(viii) condensing said second overhead product;

(ix) recovering a bottom product from a lower part of the second distillation zone comprising hydroxylic solvent, tetrahydrofuran, ethanol and water;

(x) stripping tetrahydrofuran, ethanol and water from the bottom product of step (ix) by distillation in a third distillation zone; and

(xi) recycling stripped bottom product of step (x) to the second distillation zone.

4,919,766
INSPECTION OF ELECTRODES HAVING ACTIVATED LAYERS

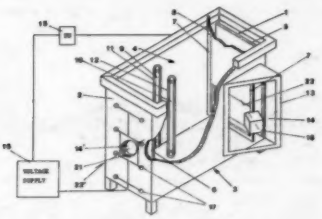
Stephan Kotowski, Seligenstadt; Bernd Busse, Darmstadt, and Bernd Donnerhak, Maintal, all of Fed. Rep. of Germany, assignors to Heraeus Elektroden GmbH, Hanau am Main, Fed. Rep. of Germany

Filed Sep. 6, 1989, Ser. No. 403,671

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1988, 3837290

Int. Cl.[5] G01N *27/26*

U.S. Cl. 204—153.1 **7 Claims**



1. Process for identifying deactivated surface areas of an activated surface layer of a basically flat electrode for use in electrochemical processes, said process comprising the following steps:

providing an electrolytic test cell having an anode and a cathode,

inserting said electrode between said anode and said cathode so that said activated surface layer faces said cathode,

applying a voltage between said anode and said cathode, and

visually inspecting said activated layer for development of gas bubbles, whereby deactivated surface areas may be identified by the absence of gas bubbles.

4,919,767
SENSOR AND METHOD FOR ANALYTE DETERMINATION

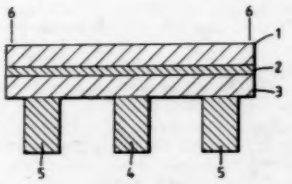
Pankaj M. Vadgama, Salford, and Lian X. Tang, Newcastle-upon-Tyne, both of England, assignors to Imperial Chemical Industries PLC, London, United Kingdom

Filed Aug. 4, 1988, Ser. No. 228,153

Claims priority, application United Kingdom, Aug. 4, 1987, 8718430

Int. Cl.[5] C12Q *1/00*

U.S. Cl. 204—153.1 **13 Claims**



1. A sensor of the enzyme-electrode type for the determination of an analyte in a sample, which analyte is convertible in the presence of an enzyme into a species which is detectable by the sensor, which sensor comprises an electrode and a membrane permeable to liquids and solutes which is positioned between the electrode and a specimen containing the analyte, which membrane comprises a first layer containing at least one enzyme and a second layer positioned between the enzyme-containing layer and the specimen, wherein said second layer contains an area through which analyte can pass, in the form of a liquid membrane formed from a porous material of which the pores have been at least partially filled with a liquid having the ability to pass the analyte while rejecting other species in the sample.

13. A method for determining an analyte in a specimen which comprises contacting the specimen with the outer layer of a membrane, permeable to liquids and solutes and comprising one or more enzymes, in the presence of which the analyte is convertible into a species detectable by a sensor which incorporates the membrane, and one or more layers of material, and measuring the response of the sensor to the species, characterized in that a layer in the membrane between the enzyme and the specimen contains an area through which analyte can pass formed from a porous material which has been treated to fill its pores wholly or partially with a liquid which has the ability to pass the analyte while rejecting other species in the specimen.

4,919,768
ELECTROPLATING PROCESS

John J. Bladon, Wayland, Mass., assignor to Shipley Company Inc., Newton, Conn.

Filed Sep. 22, 1989, Ser. No. 410,907

Int. Cl.[5] C25D *5/54*

U.S. Cl. 204—15 **22 Claims**

1. A method for electroplating an article of manufacture comprising an electrically nonconductive body portion, said method comprising the steps of:

(a) treating the surface of said nonconductor with a solution of a stannous salt;

(b) treating the surface of the nonconductor with a solution containing a dissolved sulfide capable of combining with said stannous salt;

(c) treating the surface of the nonconductor with a solution containing a dissolved platinum family metal; and

(d) metal plating the surface of the article by passing a current between electrodes immersed in an electrolyte containing dissolved plating metal, one of said electrodes comprising said nonconductor to be plated, said nonconductor having at least a portion of its surface coated with the coating formed by steps (a) through (c) herein.

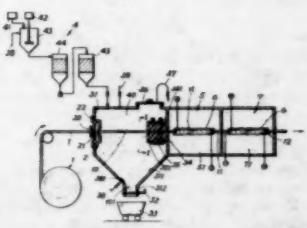
4,919,769
MANUFACTURING PROCESS FOR MAKING COPPER-PLATED ALUMINUM WIRE AND THE PRODUCT THEREOF

Mei-Mei Lin, P.O. Box 10160, Taipei, Taiwan

Filed Feb. 7, 1989, Ser. No. 307,368

Int. Cl.[5] C25D *7/06*

U.S. Cl. 204—28 **4 Claims**



1. A process for making a copper-plated aluminum wire comprising:

A. Passing an aluminum core wire in a deseration tank filled

with a deaeration medium selected from a deaerated water and an inert gas in said tank;

B. Scraping an outer surface of the aluminum core wire to form a clean mirror surface of the aluminum wire by a scraping means provided in said deaeration tank;

C. Leading the scraped aluminum core wire into a primary electroplating bath filled with a first electrolyte and provided with a copper positive electrode disposing around said scraped aluminum core wire serving as a negative electrode, and conducting a primary electroplating of a pure copper onto the scraped aluminum core wire for forming a coarse copper-plated aluminum wire; and

D. Electroplating a pure copper onto the coarse copper-plated aluminum wire in a secondary electroplating bath using a second electrolyte in said secondary electroplating bath for forming a fine copper-plated aluminum wire,

the improvement which comprises:

said first electrolyte being a copper phosphate solution and said second electrolyte being a copper sulfate solution,

said deaeration tank including:

a tank body for filling deaeration fluid therein having a front packing formed on a front portion of said tank body for passing an aluminum core wire therethrough, a cone-shaped bottom portion having a drain pipe and a slide valve provided on a lower portion of the tank body, a scrap collecting car positioned under said drain pipe for collecting aluminum scraps, a rear packing formed on a rear portion of the tank body for passing a scraped aluminum wire therethrough, a wire-scrubbing means provided before the rear packing for removing scraps accumulated on the scraped aluminum wire, an overflow pipe formed on a top portion of the tank body, a vent formed on a top portion of the tank body for forming vacuum of a drained tank body, and a recirculating pipe formed on a lower portion of the tank body for recirculating a deaeration fluid and filtering the fluid through a filter formed in the recirculating pipe for reusing the fluid; and

said wire-scrubbing means including two scrubbing elements having their lower portions pivotally secured to a hinge formed on a rear portion of said tank body and having their upper portions locked by a butterfly nut and screw, and a scrubbing material clamped in the two elements for removing scraps of aluminum wire.

4,919,770

METHOD FOR DETERMINING THE CONCENTRATION OF ELECTRO-CHEMICALLY CONVERTIBLE SUBSTANCES

Walter Preidel, Erlangen, and Konrad Mund, Uttenreuth, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 515,759, Jul. 21, 1983, abandoned. This application Dec. 19, 1986, Ser. No. 945,065

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1982, 3228542

Int. Cl.[5] G01N *27/52*

U.S. Cl. 204—153.1 **1 Claim**

1. A method for determining the concentrations of glucose, urea and/or amino acids in the presence of each other in a solution by means of an electrochemical sensor comprising a membrane-covered platinum test electrode and a counter electrode, comprising:

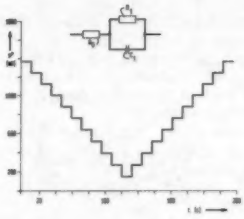
contacting the platinum test electrode with a physiological solution which contains glucose, urea and amino acids;

impressing a potential varying with time on the platinum test electrode in potential steps within a potential interval;

superimposing AC voltage of predetermined amplitude and predetermined different frequencies on the potential during at least one potential step;

establishing the real and imaginary portions of the impedance during said at least one potential step; and

determining the concentration of glucose, urea and/or amino acids from the real and imaginary portions of the



impedance established during said at least one potential step.

4,919,771

PROCESS FOR PRODUCING ALUMINUM BY MOLTEN SALT ELECTROLYSIS

Siegfried Wilkening, Alfter-Oedekoven, Fed. Rep. of Germany, assignor to VAW Vereinigte Aluminium-Werke AG, Bonn, Fed. Rep. of Germany

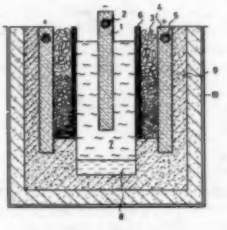
PCT No. PCT/DE79/00007, § 371 Date Oct. 9, 1979, § 102(e) Date Sep. 20, 1979, PCT Pub. No. WO79/00606, PCT Pub. Date Aug. 23, 1979

PCT Filed Jan. 24, 1979, Ser. No. 143,139

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1978, 2805374

Int. Cl.[5] C25C *3/06*

U.S. Cl. 204—67 **8 Claims**



1. The process of producing aluminum from aluminous material by molten salt electrolysis in a cell having anodic and cathodic bodies and an electrolyte including an aluminum halide salt at a temperature above the melting temperature of aluminum, comprising the steps of:

(a) providing a mixture of aluminous material and a carbon source with a conductor of higher conductivity than the mixture,

(b) providing a bipolar electrode with two surfaces respectively acting as cathode and anode, and covering the anode surface only with said mixture,

(c) subjecting the mixture to electrolytic reaction to an anodic body reaction site in the electrolyte with said conductor extending below the electrolyte surface to convert the aluminous material to an aluminum ionic condition migratory through the electrolyte to the cathodic body and to convert carbon to a carbon oxide gas,

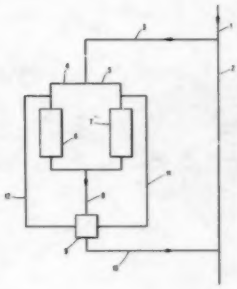
(d) producing an electrolytic reaction at a temperature of the order of 680° to 850° C. for consuming at least part of the anodic body to produce aluminum and substantially CO_2 output products.

4,919,772

ELECTROLYTIC CELL/PROCESS FOR THE REDUCTION OF TITANIUM/IRON SOLUTIONS

Jean Bachot, Bourg/La/Reine, and Olivier Le Roux, Paris, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed May 16, 1988, Ser. No. 194,165
Claims priority, application France, May 15, 1987, 87 06818
Int. Cl.[5] C25C *1/00, 1/06*
U.S. Cl. 204—96 18 Claims



1. An electrolytic cell adapted for the reduction of a solution containing titanium and ferric ions, comprising an anode compartment, a cathode compartment, a cationic exchange membrane separating said anode and cathode compartments and means for circulating said solution containing titanium and ferric ions in said cathode compartment, wherein said ferric ions are reduced to ferrous ions in said cathode compartment.

4,919,773

METHOD FOR IMPARTING EROSION-RESISTANCE TO METALLIC SUBSTRATES

Subhash K. Naik, Milford, Conn., assignor to Avco Corporation, Providence, R.I.

Division of Ser. No. 864,995, May 20, 1986, Pat. No. 4,761,346, which is a continuation-in-part of Ser. No. 672,912, Mar. 19, 1984, abandoned. This application Jun. 8, 1988, Ser. No. 204,070
Int. Cl.[5] C25D *5/00*; C23C *16/00*
U.S. Cl. 204—38.4 21 Claims

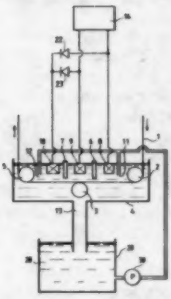
1. A method for imparting erosion-resistance to a metallic substrate without an attendant loss in the fatigue life of the substrate which comprises applying to the substrate a first ductile barrier layer having a thickness between about 0.1 and 1.5 mils comprising a metal selected from the noble metal group of elements, in direct contact with the substrate, applying a second layer of pure metal selected from Group III to Group VI elements having a thickness between about 0.2 and 1.5 mils to said first layer, and then applying at substantially low temperatures, above about 400° F., a third layer which overcoates the second layer, the third layer having a thickness between about 0.2 and 2.5 mils and comprising a hard material formed of a boride, carbide, nitride or oxide of a metal selected from Group III to Group VI elements, the first layer being capable of retaining substrate integrity and preventing diffusion of material from the second layer into the substrate.

4,919,774

ELECTROLYTICALLY TREATING METHOD

Shinichiro Minato, and Atsuo Nishino, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 22, 1988, Ser. No. 234,860
Claims priority, application Japan, Aug. 21, 1987, 62-206584
Int. Cl.[5] C25F *3/00, 1/00*
U.S. Cl. 204—129.4 4 Claims



1. A method of continuously electrolytically treating a metal web, comprising the steps of:

conveying said web in an electrolytic liquid;

supplying an alternating waveform current to said electrolytic liquid via a pair of main electrodes such that a surface of said metal web experiences an anode reaction and a cathode reaction;

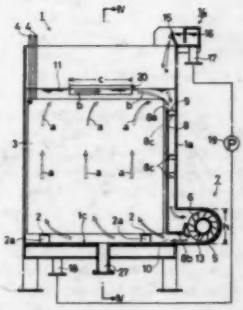
controlling a current value contributing to said anode reaction acting on said metal web surface and a current value contributing to said cathode reaction acting on said metal web surface so as to control the ratio thereof by supplying a direct current to an auxiliary anode electrode, said auxiliary anode electrode being separate from said main electrodes.

4,919,775

METHOD AND APPARATUS FOR ELECTROLYTIC TREATMENT OF SLUDGE

Eiichi Ishigaki, Sakaide, Japan, assignor to Ishigaki Kiko Co., Ltd., Tokyo, Japan

Filed Sep. 9, 1988, Ser. No. 242,136
Claims priority, application Japan, Sep. 28, 1987, 62-245219
Int. Cl.[5] C02F *1/00, 11/00*
U.S. Cl. 204—149 4 Claims



1. A method for electrolytic treatment of sludge wherein the sludge is electrolytically treated in an electrolytic tank

equipped with a multiplicity of electrode plates, anodic and cathodic, in which the anodic and cathodic plates are alternatively arranged side-by-side at short intervals in a row, said method comprising the steps of:

supplying sludge into said electrolytic tank through a sludge inlet port formed in one side wall of the tank which is parallel to the electrode plates;

producing a circulating current of the sludge being treated within said electrolytic tank, said circulating current including

an upward current flowing upward between individual electrode plates,

a surface current flowing above the row of electroplates in the tank and near the surface level of the sludge along the top edges of the electroplates, in a specified direction,

a downward current flowing downward within the tank and along one side of the row of the electroplates, and

a bottom current flowing under the row of the electroplates in the tank and along the lower edges of the electroplates in a direction opposite to the direction of the surface current,

so that gas bubbles produced between the individual electroplates and flocs present between the electroplates are removed from their inter-plate locations and carried to the surface of the tank by said upward current, the surfaced bubbles and flocs being then carried by said surface current to a location which is outside the surface area above the electrode plates;

sprinkling sludge over the bubbles carried to said location to knock down and dissolve the bubbles; and

withdrawing the sludge electrolytically treated within the tank from the tank through a sludge outlet port formed in another side wall of the tank which is parallel to the electroplates.

4,919,776

FERROMAGNETIC POWDER AND METHOD FOR PRODUCING THE SAME

Mikio Kishimoto; Tomoji Kawai, and Shichio Kawai, all of Osaka, Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Division of Ser. No. 145,878, Jan. 20, 1988, abandoned, which is a continuation of Ser. No. 751,726, Jul. 3, 1985, abandoned. This application May 24, 1989, Ser. No. 356,207

Claims priority, application Japan, Jul. 6, 1984, 59-141033

Int. Cl.[5] B01J *19/08;* **B05D** *3/06*

U.S. Cl. 204—157.4 **17 Claims**

1. A method for producing ferromagnetic powder comprising metal oxide magnetic particles and a magnetic metal layer of at least one metal selected from the group consisting of iron, cobalt and nickel which is formed on surfaces of the metal oxide magnetic particles and has a magnetic easy axis of magnetization in substantially the same direction as that of the metal oxide magnetic particles, which comprises dispersing metal oxide magnetic particles in a liquid medium containing a reducing agent and at least one metal ion selected from the group consisting of iron ion, cobalt ion and nickel ion to form a dispersion, irradiating the dispersion with light having energy which is larger than the band gap energy between the valence band and the conduction band of the metal oxide magnetic particles to reduce the ion and forming a magnetic metal layer on the surfaces of the metal oxide magnetic particles.

4,919,777

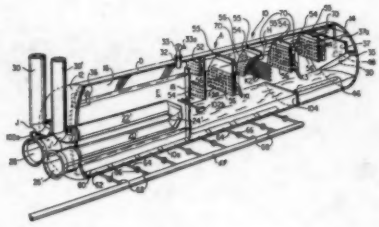
ELECTROSTATIC/MECHANICAL EMULSION TREATING METHOD AND APPARATUS

Hendrix R. Bull, P.O. Box 271203, Escondido, Calif. 92027

Continuation-in-part of Ser. No. 35,554, Apr. 7, 1987. This application Jun. 25, 1987, Ser. No. 66,770

Int. Cl.[5] B01D *19/00*

U.S. Cl. 204—188 **21 Claims**



11. A method of continuously treating a flow of an emulsion of oil, gas and brine in order to separate said emulsion into its components including the steps of:

(i) directing said continuous flow of emulsion sequentially through at least two heating zones and a treatment zone;

(ii) heating said emulsion when in said first heating zone only to the extent that the viscosity thereof is lowered sufficiently to permit entrained gas and brine to separate therefrom;

(iii) further heating said emulsion when in each of said additional heating zones in order to further lower the viscosity thereof to permit additional gas and brine to separate therefrom;

(iv) directing said de-gassed emulsion from the last heating zone to the treatment zone by passing said emulsion through diffusion and distribution means in said treatment zone in order to control the flow thereof;

(v) directing said diffused emulsion through an electrostatic field in said treatment zone in order to induce an electrical charge on the brine droplets comprising said brine emulsion;

(vi) directing said emulsion, with said electrically charged brine droplets, in said treatment zone to brine coalescing means comprising a plurality of electrically grounded elongated open-ended metal flow tubes positioned in downstream relationship to said diffusion and distribution means and passing said emulsion through said electrically grounded elongated flow tubes, thereby to collect and coalesce emulsified brine remaining in the emulsion on said coalescing means, causing the emulsified brine to coalesce into drops that flow by gravity to the bottom of said treatment zone, with the de-emulsified oil rising to the top of the emulsion in said treatment zone to float as a strata thereon;

(vii) continuously accumulating and removing the gas accumulated in said heating zones;

(viii) continuously accumulating and removing the brine upon separation from the emulsion in said heating zones and said treatment zone; and,;

(ix) continuously accumulating and removing the oil upon separation from the emulsion in said treatment zone.

4,919,778

PROCESS FOR THE PRODUCTION OF CURVE GLAZING WITH A HIGH TRANSMITTANCE IN THE VISIBLE SPECTRAL RANGE AND A HIGH REFLECTANCE FOR THERMAL RADIATION

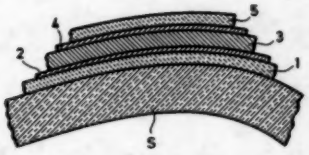
Anton Dietrich, Wiesenfelden; Klaus Hartig, Rosneburg, and Joachim Szczyrbowski, Regensburg, all of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 881,704, Jul. 3, 1986, abandoned. This application May 19, 1989, Ser. No. 356,668

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1985, 3543178

Int. Cl.[5] C23C *14/34*

U.S. Cl. 204—192.27 **10 Claims**



1. Process for the production of curved glazing with a high transmittance in the visible range and a high reflectance for thermal radiation, comprising the following steps:

(a) coating a mineral glass substrate with a first layer of at least one oxide selected from the group consisting of stannic oxide, silicon dioxide, aluminum oxide, tantalum oxide, and zirconium oxide,

(b) coating the first layer with a second layer of at least one metal selected from the group consisting of tantalum, tungsten, nickel, and iron or alloys with at least fifty percent by weight of one of these metals, the thickness of this layer being selected to have a lower transmittance of visible light than desired in the finished glazing,

(c) coating the second layer with a third layer selected from the group consisting of silver and a silver alloy with at least fifty percent silver by weight,

(d) coating the third layer with a fourth layer of a metal selected from the group forming the second layer, the thickness of said fourth layer being selected to have a lower transmittance of visible light than desired in the finished glazing,

(e) coating the fourth layer with a fifth layer of at least one oxide selected from the group forming the first layer,

(f) heating the coated substrate in an oxidizing atmosphere at least to the softening temperature of the glass until the second and fourth layers are oxidized sufficiently to increase the average transmittance by at least 5 percent,

(g) bending the substrate during said heating in said oxidizing atmosphere.

4,919,779

METHOD FOR PRODUCING ELECTRICALLY CONDUCTIVE CARBON FILM

Akira Mizoguchi; Jun Shioya; Yoichi Yamaguchi, and Yoshinobu Ueba, all of Osaka, Japan, assignors to Director-General, Agency of Industrial Science and Technology, Tokyo, Japan

Filed Aug. 17, 1988, Ser. No. 233,415

Claims priority, application Japan, Aug. 21, 1987, 62-206263

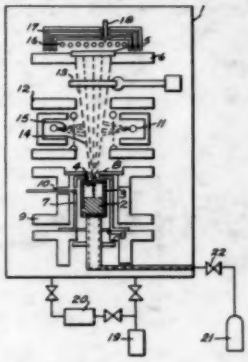
Int. Cl.[5] C23C *14/00*; B05D *3/06*

U.S. Cl. 204—192.31 **3 Claims**

1. A method for forming an electrically conductive carbon film on a substrate comprising the steps of:

maintaining a substrate at substantially room temperature; and

ionizing an organic compound having at least one substituent selected from the group consisting of a carbonyl group, an aldehyde group, an acyl group, an acid anhydride group, an amino group, a nitro group, a hydroxyl group, an alkoxyl group, a thiol group and a halogen or a



cluster of said organic compound with an ion beam which accelerates ionized species towards the substrate by an electric field thereby forming a carbon film on the substrate.

4,919,780

METHOD OF MAKING SELF-ALIGNED APERTURES

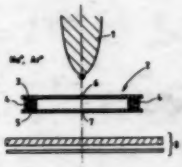
Hans-Werner Fink, Gattikon; Roger Morin, Marseille; Heinz Schmid, Oberrieden, and Werner Stocker, Wadenswil, all of Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 3, 1989, Ser. No. 333,386

Claims priority, application European Pat. Off., Jul. 22, 1988, 88111803.8

Int. Cl.[5] B23K *28/00*

U.S. Cl. 204—192.34 **11 Claims**



1. Method for making self-aligned apertures in a lens structure (2) for use in ion or electron microscopy, characterized by the steps of placing a sharply pointed electrically conductive tip (1) in front of said lens structure (2) consisting at least of first and second metal foils (3, 5; 11 . . . 13) held in a parallel arrangement at a distance determined by a plurality of insulating media (4; 9, 10), said tip having a surface and an apex on the surface of the tip, said apex being located at a point on the surface of the tip which is closest to the metal foils, said tip having from one to three atoms on the surface of the tip at the apex of the tip, bombarding said foils (3, 5; 11 . . . 13) with heavy ions at a narrowly confined area thereof, sputtering holes (6, 7; 14) through said foils (3, 5; 11 . . . 13), monitoring the arrival of the first ions passing through said holes (6, 7; 14) by detector means (8) arranged on the side of said lens structure (2) facing away from said tip (1), and terminating the sputtering operation upon the arrival of the first ions at said detector means (6).

4,919,781

FLUORINE GENERATING ELECTROLYTIC CELLS

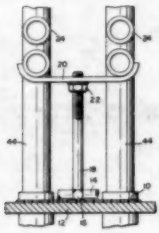
Roland Leeming, Preston, United Kingdom, assignor to British Nuclear Fuels plc, Risley, England

Filed Nov. 7, 1988, Ser. No. 268,284

Claims priority, application United Kingdom, Nov. 20, 1987, 8727188

Int. Cl.[5] C25B 9/00

U.S. Cl. 204—241 8 Claims



1. A fluorine-generating electrolytic cell having a base, cooling coils in the cell for cooling the electrolyte and being displaced from the base, a layer of material disposed on the base to electrically insulate the base, and means bridging the space between the cooling coils and an upwardly presented face of the layer so as to hold the layer against the base.

4,919,782

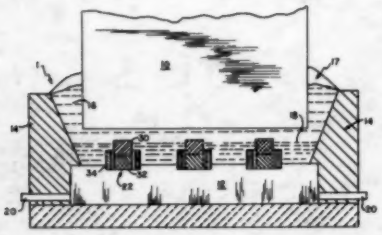
ALUMINA REDUCTION CELL

Douglas V. Stewart, Florence, Ala., assignor to Reynolds Metals Company, Richmond, Va.

Filed Feb. 21, 1989, Ser. No. 312,833

Int. Cl.[5] C25C 3/08

U.S. Cl. 204—243 R 16 Claims



1. In an alumina reduction cell having an anode, a carbonaceous cathode, a plurality of refractory hard metal (RHM) shapes, said RHM shapes having a height sufficient to extend vertically upwardly through a molten aluminum pad and into an alumina-cryolite bath, and a plurality of inert refractory stabilizing sleeves for said RHM shapes, said sleeves being fixedly mounted to said cathode, said sleeves extending vertically into said molten aluminum pad but not into said alumina-cryolite bath, the improvement comprising means for supporting said RHM shapes within said sleeves to thereby permit a reduction in the volume of RHM material in said RHM shapes, said means comprising platforms of carbonaceous material extending upwardly from said cathode and positioned within said sleeves, said platforms having a height less than said sleeves to permit said RHM shapes to rest upon said platforms and within said sleeves without becoming dislodged from said sleeves during movements of said molten aluminum pad.

4,919,783

APPARATUS FOR PROCESSING AN OBJECT BY GAS PLASMA WITH A REDUCED DAMAGE

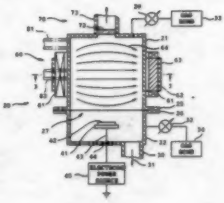
Tatsuo Asamaki; Hideo Mito; Yukito Nakagawa, and Atsushi Sekiguchi, all of Tokyo, Japan, assignors to Anelva Corporation, Tokyo, Japan

Filed Dec. 4, 1987, Ser. No. 128,775

Claims priority, application Japan, Dec. 5, 1986, 61-289920

Int. Cl.[5] C23C 13/08, 14/00

U.S. Cl. 204—298.16 17 Claims



1. An apparatus operable in an electron cyclotron resonance mode to process an object by using plasma generated by interaction of a magnetic field, an electromagnetic wave, and a predetermined gas, said apparatus comprising:

a reaction vessel defining a hollow space and having a vessel axis and first and second parts which define first and second spaces, respectively, by spatially dividing said hollow space in a direction orthogonal to said hollow space, said first and said second parts being attached to each other through an interface;

means for introducing said predetermined gas at least into said first space;

holding means for holding an object to be processed in said second space at a state transverse to said vessel axis;

magnetic field generating means adjacent to said first part for generating a magnetic field which is confined substantially within said first space and which has lines of magnetic force transverse to said vessel axis and substantially parallel to said interface to prevent charged particles from passing through said interface; and

means for supplying said electromagnetic wave into said first space to produce said gas plasma by making said predetermined gas, said electromagnetic wave, and said magnetic field interact with one another.

4,919,784

ELECTROPHORRESIS CASSETTE SPACER

David S. Yetman, Merrimack, Mass., assignor to EG&G, Inc., Wellesley, Mass.

Filed Aug. 16, 1989, Ser. No. 394,554

Int. Cl.[5] G01N 27/28, 27/26; B01D 57/02

U.S. Cl. 204—299 R 12 Claims

1. An electrophoresis cassette, comprising:

a first flat plate having two sides which are substantially parallel to each other and having top and bottom edges;

a second flat plate having two sides which are substantially parallel to each other and having top and bottom edges;

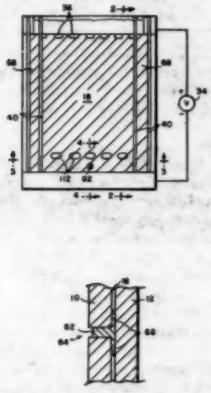
means for holding the first and second plate in a fixed relationship with each other wherein the sides of the first plate are substantially parallel to the sides of the second plate and the opposing faces of the plates are separated by a predetermined distance to form a space therebetween, the sides, bottom edges and top edges of the plates corresponding to the sides, bottom edge and top edge of the assembled cassette;

the space between the plates being adapted for filling with a gel in which an electrophoresis separation may be performed;

the means for holding including means for providing a seal

between the first and second plates along each of the sides of the cassette;

at least one spacer located between the first and second plates and between the seals along each of the cassette sides and including a flat portion, the thickness of which is



equal to the predetermined distance between the plates, and a protrusion which extends from the flat portion;

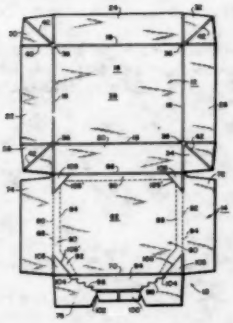
one of the front and back plates including an opening on the inside surface thereof for receiving the protrusion to maintain the spacer in a fixed position.

4,919,785

MICROWAVE CARTON

Monroe J. Willey, East Brunswick, and Daniel D. Evert, Englishtown, both of N.J., assignors to Kraft General Foods, Inc., Glenview, Ill.

Filed Apr. 28, 1988, Ser. No. 192,262
Int. Cl.[5] B65D *5/24, 5/40, 5/54*
U.S. Cl. 206—625 **6 Claims**



1. A microwave carton which is constructed from a unitary carton blank, said carton comprising:

a carton bottom structure including a substantially rectangular bottom panel, side panels extending from the periphery of said bottom panel and web corners extending between the side panels, crease lines formed along the periphery of said bottom panel, at the intersection of the web corners with the sides and centrally along the web corners to enable folding of the side panels normally of the bottom panel so as to provide a liquid-containing carton bottom structure;

a substantially rectangular carton top structure including a top panel which is integrally connected along a first edge with an outer edge of one of said side panels and being dimensioned to overlie the bottom structure;

a front flap extending from a second edge of said top panel opposite said first edge;

side flaps foldably connected to side edges of said top panel along crease lines located between said first and second edges;

tearable joints extending along said top panel, with first and second upper score lines extending along the crease lines which foldably connect the side flaps to the top panel, then being angled towards each other as they approach the side panel which connects the top panel to the bottom panel, then along a crease which foldably connects said top panel to the side panel which connects the top panel to the bottom panel where the first and second upper score lines connect, said upper score lines extending along said foldable connections in a non-continuous fashion in the form of perforated cut scores and generally parallel to and spaced apart from third and fourth lower cut score lines over a major portion of the top panel, said upper and lower score lines also being angled towards each other towards said front flap, said upper score lines meeting foraminations in the front flap, and wherein said angled score lines are continuous, said spacing apart of the upper and lower score lines forming a tearing distance therebetween over a portion of said top panel; and wherein,

the front flap, which is integral with and hinged to the second edge of said top panel, includes a lifting tab, which is formed centrally at the free edge of said front flap, and includes said foraminations which extend between said lifting tab and said tearable joints in said top panel.

4,919,786

PROCESS FOR THE HYDROISOMERIZATION OF WAX TO PRODUCE MIDDLE DISTILLATE PRODUCTS

Glen P. Hamner, deceased, late of Baton Rouge, La. (by Nita A. M. Hamner, executrix); Willard H. Sawyer, Baton Rouge, La., and Heather A. Boucher, Point Edward, Canada, assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 134,960, Dec. 18, 1987, abandoned. This application Dec. 13, 1988, Ser. No. 283,681
Int. Cl.[5] C10G *65/12, 67/02, 73/38*
U.S. Cl. 208—27 **26 Claims**

13. A process for producing middle distillate fuel products from a Fischer-Tropsch wax containing oxygenate compounds, which process comprises:

(1) separating the Fischer-Tropsch wax into (a) a low-boiling fraction which contains most of the oxygenate compounds and (b) a high-boiling fraction which is substantially free of water and oxygenate compounds;

(2) reacting the high-boiling fraction from step (1) with hydrogen in a hydroisomerization zone in the presence of a fluorided Group VIII metal-on-alumina catalyst to convert from about 50 to about 95 percent of the 700° F.+ material present in the high-boiling fraction thereby maximizing the production of middle distillate product boiling in the range about 320° F. to 700° F., said catalyst having (a) a bulk fluoride concentration ranging from about 2 to about 10 weight percent, wherein the fluoride concentration is less than about 3.0 weight percent at the outer surface layer to a depth less than one one hundredth of an inch, provided the surface fluoride concentration is less than the bulk fluoride concentration, (b) an aluminum fluoride hydroxide hydrate level greater than about 60 where an aluminum fluoride hydroxide hydrate level of 100 corresponds to the X-ray diffraction peak height at

5.66 Å for a Reference Standard and (c) a N/Al ratio less than about 0.005; and

(3) separating the product from step (2) into at least one fraction having a final boiling point below about 320° F. at atmospheric pressure, a middle distillate fraction boiling in the range of about 320°–700° F. at atmospheric pressure and a residual fraction having an initial boiling point above 700° F. at atmospheric pressure.

4,919,787

METAL PASSIVATING AGENTS

Arthur W. Chester, Cherry Hill; Pochen Chu, West Deptford, both of N.J.; Albin Huss, Jr., Chadds Ford, Pa., and Garry W. Kirker, Sewell, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 138,002, Dec. 28, 1987, abandoned. This application Apr. 7, 1989, Ser. No. 335,069

Int. Cl.[5] C10G *11/05*

U.S. Cl. 208—52 CT **37 Claims**

1. Method for passivating metals in a hydrocarbon feedstock contaminated with said metals, which comprises contacting the feedstock under passivating conditions with an effective amount of a precipitated, porous, passivating agent comprising rare earth oxide-aluminum oxide-aluminum phosphate.

4,919,788

LUBRICANT PRODUCTION PROCESS

Nai Y. Chen, Titusville; William E. Garwood, Haddonfield; Tracy J. Huang, Lawrenceville; Quang N. Le, Cherry Hill, and Stephen S. Wong, Medford, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 793,937, Nov. 1, 1985, abandoned, and a continuation-in-part of Ser. No. 821,125, Jan. 22, 1986, abandoned, which is a continuation-in-part of Ser. No. 685,089, Dec. 21, 1984, abandoned. This application Oct. 21, 1988, Ser. No. 260,857

Int. Cl.[5] C10G *67/02, 69/02*

U.S. Cl. 208—59 **30 Claims**

1. A process for producing a lubricating oil of improved pour point and viscosity index which comprises

(i) catalytically dewaxing a lube feed stock having an initial boiling point of at least 650° F. containing waxy, paraffinic components in an initial catalytic dewaxing step with a dewaxing catalyst comprising zeolite beta having a silica:alumina ratio of at least 10:1 and a hydrogenation-dehydrogenation component, in the presence of hydrogen under dewaxing conditions of elevated temperature from 480° to 850° F. and pressure of up to 1000 psig and at a contact time between the feed and the catalyst which effects a partial removal of the waxy components by isomerization of the waxy paraffinic components to less waxy iso-paraffinic components, to increase the content of iso-paraffinic components in the stock relative to the content of iso-paraffinic components in the feed; and

(ii) subjected the effluent from the initial catalytic dewaxing step to a selective dewaxing operation in which straight chain, waxy paraffinic components are removed in preference to iso-paraffinic components, to lower the pour point of the stock to produce a dewaxed lubricant product having a targeted pour point and viscosity index.

4,919,789

PRODUCTION OF HIGH OCTANE GASOLINE

Ronald H. Fischer, Cherry Hill; Rene B. LaPierre, Medford; Peter J. Owens, Mantua, and Philip Varghese, Voorhees, all of N.J., assignors to Mobil Oil Corp., New York, N.Y.

Continuation of Ser. No. 178,157, Apr. 6, 1988, which is a continuation of Ser. No. 940,382, Dec. 10, 1986, Pat. No. 4,738,766, which is a continuation-in-part of Ser. No. 825,294, Feb. 3, 1986, Pat. No. 4,676,887, which is a continuation-in-part of Ser. No. 740,677, Jun. 3, 1985, abandoned. This application Oct. 18, 1988, Ser. No. 259,211

The portion of the term of this patent subsequent to Jun. 30, 2004, has been disclaimed.

Int. Cl.[5] C10G *65/12, 69/10*

U.S. Cl. 208—61 **23 Claims**

20. A process for the production of a high octane gasoline, having an octane number not less than 87 (RON+0), from a substantially dealkylated hydrocarbon feedstock comprising not less than 50 vol % aromatic content, an API gravity between 5 and 25, a nitrogen content between 50 and 650 ppm, and a hydrogen content between 8.9 and 12.5 wt %, comprising:

hydrotreating said substantially dealkylated feedstock in the presence of a hydrotreating catalyst comprising a hydrogenation/dehydrogenation metal on a support, under hydrotreating conditions, including a pressure not greater than 1200 psig, liquid hourly space velocity between 0.25 and 5, and temperature between 600° and 800° F.;

contacting said hydrotreated substantially dealkylated feedstock with a catalyst comprising a silica matrix and a crystalline silicate zeolite having a Constraint Index less than 2, said contacting being conducted at hydrogen partial pressure between 600 and 1000 psi, temperatures not less than 700° F., LHSV between 0.25 and 2.5, and a conversion per pass to 385° F. end point gasoline no greater than 50% to form a product comprising a 385° F. end point gasoline and an unconverted, upgraded bottom fraction; and

passing said unconverted, upgraded bottom fraction to a fluid catalytic cracking (FCC) unit for further processing.

4,919,790

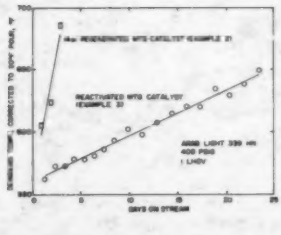
METHOD FOR HYDROCARBON DEWAXING UTILIZING A REACTIVATED SPENT MTG ZEOLITE CATALYST

Robert P. L. Absil, Mantua; Clarence D. Chang, Princeton; Cynthia T-W. Chu, Princeton Junction, and Donald J. Klocke, Somerdale, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 145,438, Jan. 19, 1988, abandoned. This application Oct. 31, 1988, Ser. No. 264,766

Int. Cl.[5] C10G *57/00, 11/05;* **B01J** *29/38, 38/64*

U.S. Cl. 208—78 **10 Claims**



1. A method for hydrocarbon dewaxing, utilizing a reactivated acidic zeolite catalyst deactivated from converting methanol to gasoline by framework dealuminization and deposition of coke on the catalyst, which comprises:

(a) subjecting the deactivated catalyst to a burning operation

in the presence of an oxygen containing gas to remove at least a major part of the accumulated coke from the catalyst;

(b) contacting the burned catalyst with an aqueous solution of an alkali metal carbonate and/or an alkaline earth metal carbonate at a temperature of from about 1° to about 370° C. for from about 1 to about 100 hours employing from about 0.001 to about 1 molar aqueous carbonate:

(c) converting the catalyst from step (b) to the catalytically active hydrogen form;

(d) steaming the reactivated catalyst of step (c) at a temperature and for a time period sufficient to reduce its alpha value to a level which is substantially equal to that of a fresh hydrocarbon dewaxing acidic zeolite catalyst; and

(e) using the reactivated catalyst of step (d) in hydrocarbon dewaxing processes.

4,919,791

CONTROLLED OPERATION OF HIGH CURRENT DENSITY OXYGEN CONSUMING CATHODE CELLS TO PREVENT HYDROGEN FORMATION

Ronald C. Miles; David D. Justice, and Kenneth E. Woodard, Jr., all of Cleveland, Tenn., assignors to Olin Corporation, Cheshire, Conn.

Continuation-in-part of Ser. No. 727,171, Apr. 25, 1985, Pat. No. 4,578,159. This application Oct. 9, 1985, Ser. No. 785,686

Int. Cl.[5] C25B *1/16, 1/26*

U.S. Cl. 204—98 **18 Claims**

1. A process for the electrolysis of an alkali metal halide brine in an electrolytic cell having an anode compartment containing at least one anode, a cathode compartment containing at least one hydrophilic porous cathode, and a cation exchange membrane separating the anode compartment from the cathode compartment, the process which comprises:

(a) feeding the alkali metal halide brine to the anode compartment;

(b) electrolyzing the alkali metal halide brine at a current density of at least about 2 kiloamperes per square meter to produce a halogen gas and alkali metal ions in the anode compartment;

(c) passing the alkali metal ions and water through the cation exchange membrane into the cathode compartment wherein contact is maintained between the cation exchange membrane and the hydrophilic porous cathode;

(d) passing the alkali metal ions and water through the hydrophilic porous cathode;

(e) feeding an oxygen-containing gas to the hydrophilic porous cathode in the cathode compartment;

(f) producing a concentrated alkali metal hydroxide solution;

(g) regulating the cell voltage to limit the formation of hydrogen; and

(h) removing the concentrated alkali metal hydroxide solution from the cathode compartment to prevent an accumulation of concentrated alkali metal hydroxide in the cathode compartment.

4,919,792

CLARIFICATION OF SLURRY OIL

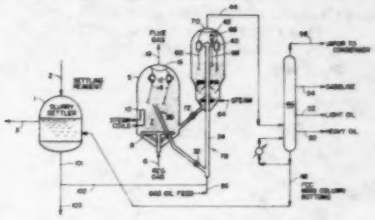
Billy K. Huh, Lawrenceville, N.J., and Tsoung Y. Yan, Philadelphia, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 10, 1988, Ser. No. 206,238

Int. Cl.[5] C10G *67/02*

U.S. Cl. 208—99 **8 Claims**

1. A process for clarifying slurry oil withdrawn from a fractionator associated with a catalytic cracking unit characterized by adding a settling reagent having a particle size of 20–5000 microns and a particle density of 0.6–4 g/cc which to the slurry oil at a temperature of 250–450 C., separating the settling reagent and catalyst fines from the slurry oil by a physical means within 10–300 minutes, to produce a clarified slurry oil product and settled fines and settling reagent and



recycling at least a portion of the settled fines and settling reagent to the catalytic cracking unit.

4,919,793

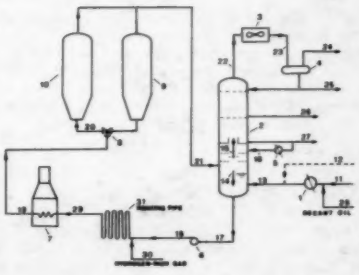
PROCESS FOR IMPROVING PRODUCTS' QUALITY AND YIELDS FROM DELAYED COKING

Renato M. Mallari, 6403 Teal Run Dr., Houston, Tex. 77035

Filed Aug. 15, 1988, Ser. No. 232,761

Int. Cl.[5] C10G *9/14*

U.S. Cl. 208—131 **5 Claims**



1. In a delayed coking process comprising of a coker fractionator, coker heater and coke drums wherein a coker fresh feed consisting of petroleum hydrocarbon derivatives from various refining processes is thermally processed in said heater and coke drums producing green coke, hydrocarbons and gases, the improvement comprising

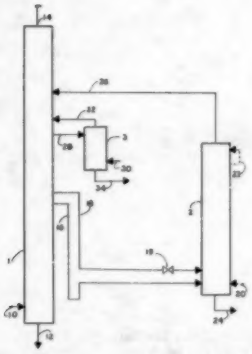
adding hydrogen-rich gas in the absence of a catalyst to the coker heater charge material in a soaking pipe with a fluid residence time in the range of about 10 to 90 minutes in an amount in the range of about 30 to 300 SCF per barrel of the heater charge material under an inlet hydrogen partial pressure in the range of about 200 to 650 psig from an inlet operating temperature in the range of about 400° F. to 650° F. to an outlet operating temperature in the range of about 50° F. to 250° F. cooler than said inlet operating temperature range to minimize a formation of converted asphaltenes and feeding the coker heater feed material thus hydrogenated directly into said coker heater without separating any constituents from said heater feed material thereby improving the quality and yields of products from the process.

4,919,794

PROCESS FOR SEPARATING HYDROCARBONS

Gregory M. Lipkin, Secaucus, and Joseph L. Niedzwiecki, Fanwood, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Oct. 17, 1988, Ser. No. 258,341
Int. Cl.[5] C10G 7/00
U.S. Cl. 208—354 **11 Claims**



1. A process for separating a fluid hydrocarbon mixture which comprises the steps of:

(a) separating said hydrocarbon mixture into at least a vapor phase fraction, a liquid fraction and a bottoms fraction having a higher boiling point than said liquid fraction in a distillation zone;

(b) introducing said liquid fraction and a portion of said vapor phase fraction into a separation zone;

(c) introducing a stripping gas into said separation zone to remove the lightest components from said liquid and vapor fractions introduced therein; and

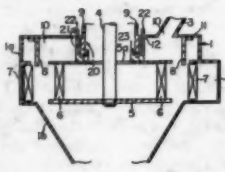
(d) passing the stripped vapor stream resulting from step (b) to said distillation zone of step (a).

4,919,795

LEAKAGE PREVENTION APPARATUS FOR A CLASSIFIER

Satoru Fujii, Onoda; Hiroaki Tanaka, Funabashi; Takeshi Furukawa; Masaaki Muraoka, both of Onoda; Ryosuke Narishima, Kawasaki, and Takamiki Tamashige, Tokyo, all of Japan, assignors to Onoda Cement Company, Ltd., Japan

Filed Jan. 13, 1989, Ser. No. 297,552
Claims priority, application Japan, Jan. 18, 1988, 63-6776; May 19, 1988, 63-120617
Int. Cl.[5] B07B 4/02, 7/00
U.S. Cl. 209—135 **7 Claims**



1. A leakage prevention apparatus for a classifier having a casing which defines an outlet a first inlet, through which said casing receives air and a second inlet through which said casing receives raw material, said classifier also having a rotary classifying impeller disposed in the casing for dispersing the raw material which the casing receives and for moving a fine powder component of the raw material and discharging said fine powder component through said outlet, said apparatus comprising:

a rotary seal member mounted on the rotary classifying impeller; and

a fine powder discharge duct in communication with said outlet of said casing for receiving the fine powder component of the raw material which discharges from the casing, said duct and the portion of the casing disposed around said outlet defining an opening;

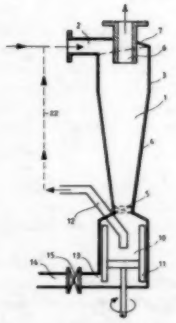
said seal member including one end portion secured to the impeller and a second distal end disposed outwardly of the impeller, said second end extending into said opening between said casing and said duct and closing a substantial portion of said opening to prevent leakage of the coarse material into the duct.

4,919,796

METHOD AND APPARATUS FOR GRADING FIBER SUSPENSION

Pentti A. Viikii, Kerimäki, Finland, assignor to A. Ahlstrom Corporation, Noormarkku, Finland

Filed Aug. 23, 1988, Ser. No. 235,080
Claims priority, application Finland, Sep. 1, 1987, 873780
Int. Cl.[5] B04C 5/10
U.S. Cl. 209—211 **17 Claims**



1. A method of grading a fiber suspension having a consistency of 0.5% or more utilizing a centrifugal separator having an accepts outlet and rejects outlet, a secondary stage having a second accepts outlet and a second rejects outlet, and mechanical means for increasing the rotational speed of suspension carried to the secondary stage, comprising the steps

feeding the suspension with a consistency of 0.5% or more to the centrifugal separator;

effecting separation of the suspension into an accepts fraction and a rejects fraction;

discharging the accepts fraction through the accepts outlet of the separator;

discharging the rejects fraction through the rejects outlet of the separator and feeding it to the secondary stage;

increasing the rotational speed of the rejects fraction of the suspension during discharge to the secondary stage utilizing the mechanical means;

effecting further separation of the rejects fraction in the secondary stage to produce a second accepts fraction and a second rejects fraction;

returning the second accepts fraction to the suspension prior to the suspension being fed into the centrifugal separator through the second accepts outlet;

discharging the secondary rejects from the secondary stage through the second rejects outlet; and

preventing the secondary rejects from interfering with the

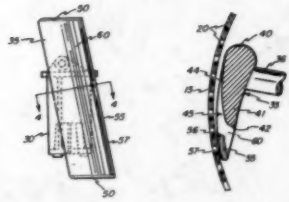
secondary accepts stream, and from blocking discharge of the secondary rejects from the secondary stage, by maintaining the rejects at a substantial rotational speed utilizing the mechanical means.

4,919,797

SCREENING APPARATUS FOR PAPER MAKING STOCK

David E. Chupka, Middletown, and Irenee J. Phillippe, Monroe, both of Ohio, assignors to The Black Clawson Company, Middletown, Ohio

Filed Feb. 9, 1989, Ser. No. 308,338
Int. Cl.[5] B07B 1/04
U.S. Cl. 209—273 8 Claims



1. Screening apparatus for paper making stock comprising:
(a) a pressure housing,
(b) a cylindrical screening member having screening perforations therethrough and dividing the interior of said housing into a supply chamber and an accepts chamber on opposite sides of said screening member,
(c) a rotor mounted for rotation in said supply chamber and including a plurality of vanes having a solid periphery of generally airfoil shape in cross section mounted thereon in angularly spaced relation with each other and in relatively closely spaced relation with said screening member,
(d) each of said vanes being oriented with the leading edge thereof closest to said screening member and with the surface portion thereof trailing said leading edge to the trailing edge of said vane diverging from said screening member to create a positive pressure force along said leading edge thereof followed by a negative pressure force between said trailing portion and said screening member, and
(e) means carried by each of said vanes in trailing relation with said trailing edge thereof for substantially containing said negative pressure force in the space between said trailing portion of said vane and said screening member and thereby concentrating said force on the surface portion of said screen member within said space while providing for direct flow from said space to the interior of sad supply chamber.

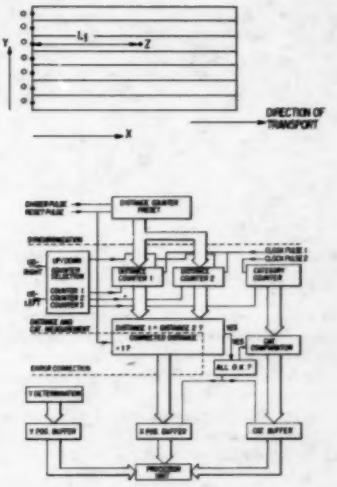
4,919,798

METHOD AND AN APPARATUS FOR SORTING AND EJECTING ARTICLES

Peter A. von Asselt, and Jan Hord k, both of Aalten, Netherlands, assignors to Staalkat B.V., Netherlands

Filed Feb. 9, 1989, Ser. No. 308,279
Claims priority, application Netherlands, Feb. 15, 1988, 8800365
Int. Cl.[5] A01K 43/00; B07C 5/36
U.S. Cl. 209—510 13 Claims

1. In a method of sorting a plurality of articles which are continuously moved past an inspection station on a moving conveyor means for removing selected ones of the articles from the conveyor means, where the position of the selected article on the moving conveyor means is indicated by a signal generated from a movable means placed in close proximity to the selected article and the signal is process to operate an ejector associated with the conveyor means for removing the selected article, the improvement comprising providing at least one fixed ultrasonic signal processing means disposed about the inspection station and at least one movable ultrasonic signal processing means which is manually movable over the inspection station, wherein the said fixed signal means and the said movable signal means are combinations of ultrasonic transmitters and receivers, determining a selected article on the conveyor means to be removed therefrom, placing the movable



signal means in close proximity to said selected article, activating the movable signal means to transmit to or receive from the said fixed signal means an ultrasonic signal, measuring the time lapse of the ultrasonic signal transmission between the said movable signal means and the fixed signal means, whereby the position of the selected article on the conveyor means is determined, moving the conveyor means sufficiently that the position of the selected article is adjacent to the ejector and operating the ejector to remove the selected article from the conveyor means.

4,919,799

OPTICAL CODE READER SORTING APPARATUS CONDITIONED BY TRIGGER INDICIA

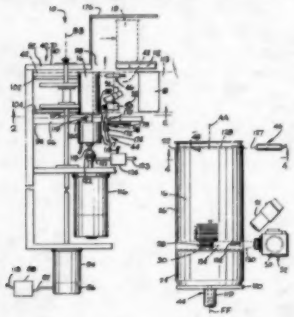
Elaine A. Menardi, Westminster; Terrence E. Rhodes, Broomfield, and David R. Siemer, Golden, all of Colo., assignors to Adolph Coors Company, Golden, Colo.

Filed Dec. 14, 1988, Ser. No. 285,518
Int. Cl.[5] B07C 5/02; G06K 7/016
U.S. Cl. 209—538 32 Claims

1. An apparatus for distinguishing between generally identically shaped objects having a first end, a second end, a central longitudinal axis and a longitudinally extending sidewall based upon code indicia provided on a predetermined, relatively small surface area portion on the sidewall of each object, comprising:
(a) transfer means for moving said objects in single file relationship along a transfer path extending substantially perpendicular to the longitudinal axes of the objects being moved therealong;
(b) spinning means for engaging an object in said transfer path and for spinning said engaged object about its longi-

tudinal axis during a relatively short duration spinning period without removing said object from said transfer path;

(c) trigger means for sensing the passage of a trigger indicia, located at a predetermined circumferential position on the surface of said object relative to said code indicia, during the spinning of said object by said spinning means and for generating a trigger signal responsive thereto;



(d) code indicia reading means for reading said code indicia printed on said object and for generating an indicia reading signal indicative of indicia read thereby; and

(e) reading actuation means responsive to said trigger signal for actuating said code indicia reading means for a short duration period during the spinning of said object at a time when said code indicia on said object is positioned in readable relationship with said reading means.

4,919,800

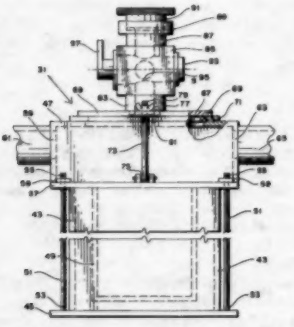
FLUSHING MEANS FOR A MARINE ENGINE

Todd Vinoski, 537 NE. 137th St., North Miami, Fla. 33161

Filed Sep. 26, 1988, Ser. No. 248,595

Int. Cl.[5] B01D *35/00*

U.S. Cl. 210—94 **6 Claims**



1. A cooling system for a liquid-cooled internal combustion marine engine, said cooling system comprising a coolant intake pipeline connected at one end thereof to the engine block of said engine, a coolant strainer in said intake pipeline, said strainer comprising a container having a removable metal cover, an improvement comprising means for controllably introducing flushing liquid into said strainer through said cover.

4,919,801

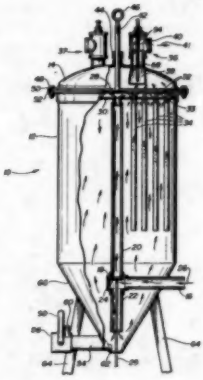
CONTROL SYSTEM FOR PUMP CYCLING

Russell Hobson, Jr., Rte. 1, Box 30, Old Fort, N.C. 28752

Filed Jan. 7, 1988, Ser. No. 141,650

Int. Cl.[5] B01D *29/28, 29/32*

U.S. Cl. 210—104 **6 Claims**



1. A filter for filtering fluid flowing therethrough, comprising:

a casing;

at least one tube sheet dividing said casing into a lower chamber and an upper chamber and being vertically movable within said casing, said tube sheet having openings therethrough;

a filter unit in each said opening in said tube sheet;

at least one fluid outlet in said filtered chamber;

fluid inlet means in said unfiltered chamber;

tube sheet movement means external to said casing for moving said tube sheet, said means being disposable between at least a first position permitting said movement of said tube sheet and at least a second position prohibiting said movement of said tube sheet; and

sensor means to determine the position o said movement means, for respectively prohibiting and permitting fluid flow through said filter when said movement means is respectively in said first and said second position.

4,919,802

BLOOD FILTER

Yoshiro Katsura, Fuji, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 30, 1988, Ser. No. 278,001

Claims priority, application Japan, Dec. 4, 1987, 62-307032

Int. Cl.[5] B01D *19/00, 35/30*

U.S. Cl. 210—188 **8 Claims**

1. A blood filter, comprising:

a filter housing;

said housing forming a bubble separating section including

a chamber defined by said housing and having a generally circular cross section for allowing bubbles to separate from blood when introduced into said chamber,

a vent formed at upper end of the housing to communicate with the chamber for discharging air from said bubbles,

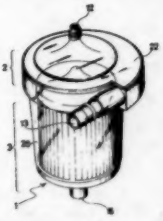
an inlet conduit horizontally extending from the housing for introducing blood into the chamber, the axis of said inlet conduit extending substantially parallel to a tangent line of the generally circular chamber in the vicinity of the connection between the chamber and the inlet conduit, the inlet conduit axis being outside said chamber and being offset a certain distance from said tangent

line in a plane perpendicular to the axis of said chamber, and

said housing defining an inflow portion merging the inlet conduit to the chamber, and

said housing forming a blood filter section disposed below said bubble separating section, including

an outlet disposed at a lower end of the housing for discharging blood, and



a filter member disposed in said housing between the inlet conduit and the outlet,

wherein said inflow portion is contoured so that said inflow portion introduced incoming blood from the inlet conduit to flow as a substantial laminar flow up to an existing swirl blood flow in the chamber, and to merge with the swirl blood flow without substantial disturbance of the swirl blood flow.

4,919,803

LIQUID CHROMATOGRAPHIC CHIRAL STATIONARY PHASE

Thomas D. Doyle, Burke; Charlotte A. Brunner, Alexandria, both of Va., and Edward Smith, Rockville, Md., assignors to The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Filed Dec. 9, 1988, Ser. No. 281,778

Int. Cl.[5] B01D *15/08*

U.S. Cl. 210—198.2 **8 Claims**

1. A packing material for chromatographic use which comprises a chiral stationary phase formed from a silica support bonded to the (R)- or (S)-form of 6-methoxy-α-methyl-2-naphthaleneacetic acid via an amide linkage.

4,919,804

ULTRASOUND DRIVEN SYNTHESIS OF REVERSED AND NORMAL PHASE STATIONARY PHASES FOR LIQUID CHROMATOGRAPHY

John G. Dorsey; Karen B. Sentell, both of Gainesville, Fla., and Karen W. Barnes, Verona, N.J., assignors to University of Florida, Gainesville, Fla.

Continuation of Ser. No. 162,515, Mar. 1, 1988, abandoned. This application May 1, 1989, Ser. No. 346,286

Int. Cl.[5] B01D *15/08*

U.S. Cl. 210—198.2 **8 Claims**

1. In a method for the production of a reversed phase bonded metal oxide particularly adapted for use as a packing in high performance liquid chromatography, said method comprising reacting said metal oxide, in which at least some of the oxide groups have been converted to hydroxyl groups, with a substituted or unsubstituted alkyl silane reactive with said hydroxyl groups to produce a silyated derivative of said metal oxide, the improvement comprising conducting said reaction in the presence of ultrasonic waves at a temperature below about 20° C.

4,919,805

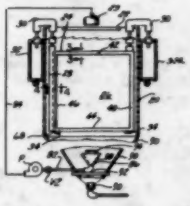
VERTICAL LEAF FILTER FLUSH

Willard L. Johnson, 12923 Lincoln Ave., Huntington Woods, Mich. 48070

Division of Ser. No. 932,010, Nov. 26, 1986, Pat. No. 4,790,935. This application Jun. 3, 1988, Ser. No. 202,149

Int. Cl.[5] B01D *29/32*

U.S. Cl. 210—332 **5 Claims**



1. In a leaf filter apparatus including an open topped tank for receiving a continuous flow of contaminated liquid to be filtered, a plurality of panel-like filter leafs mounted within said tank in closely spaced adjacent parallel relation with said leafs disposed in vertical general planes, said leafs being operable to separate particles from said liquid by collecting said particles on the exterior surfaces of said leafs while passing said liquid into a filtrate discharge system;

the improvement comprising pump means operable to pump contaminated liquid from an intake in communication with the spaces between the filter leaves adjacent the bottom of said tank at a location below said filter leafs and to discharge said liquid back into the top of said tank to thereby induce an increased downward flow of liquid across the exterior surfaces of said filter leafs to flush collected particles therefrom toward the bottom of said tank while filtering.

4,919,806

CROSS-FLOW TYPE FILTER SYSTEM

Aisuburo Yagishita, Aichi, Japan, assignor to Goshi Kaisha Yagishita, Aichi, Japan

Filed Aug. 24, 1988, Ser. No. 235,503

Claims priority, application Japan, Aug. 28, 1987, 62-213098

Int. Cl.[5] B01D *25/38*

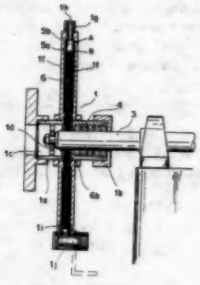
U.S. Cl. 210—334 **4 Claims**

1. A cross-flow type filter apparatus comprising:

a filter body divided into at least one primary chamber and

at least one pair of secondary chambers, each of said at least one primary chambers being positioned between and spaced apart from pair members of said at least one pair of secondary chambers by porous support means which support filter media;

a disc shaped rotor positioned within each of said at least one primary chambers adjacent and parallel to facing surfaces of said filter media which are supported on pair members of said at least one pair of secondary chambers by said porous support means, sad rotor being rotatably mounted on a rotor shaft which extends through the center of said rotor, said rotor shaft extending perpendicular to said surfaces of said filter media, said rotor having through-holes therein adjacent said rotor shaft for allowing fluid to flow therethrough and in a direction parallel to said rotor shaft;



feed inlet passage means located in a portion of said filter body which houses said rotor shaft, said feed inlet passage means being positioned adjacent one end of said rotor shaft and;

fluid outlet passage means located on a peripheral surface of a portion of said filter body which houses said at least one primary chamber and said at least one pair of secondary chambers, both said inlet and outlet passage means being in fluid communication with each of said at least one primary chambers,

said fluid inlet passage means, said fluid outlet passage means and said through-holes being positioned so that fluid entering said fluid inlet passage means flows radially outward from said rotor shaft in each of said at least one primary chambers and is substantially uniformly distributed to flow parallel to each filter media and out said fluid outlet passage means.

4,919,807

ULTRASONIC VIBRATOR TRAY APPARATUS

William E. Morton, Bridgeport, W. Va.; Harold V. Fairbanks; James Wallis, both of Morgantown, all of W. Va.; Raymond L. Hunicke, Roxbury, and Joseph Krenicki, Danbury, both of Conn., assignors to Heritage Industries, Inc., Bridgeport, W. Va.

Continuation-in-part of Ser. No. 886,010, Jul. 7, 1986, Pat. No. 4,741,839. This application May 2, 1988, Ser. No. 189,361

Int. Cl.[5] C02F *1/34*

U.S. Cl. 210—388 **20 Claims**

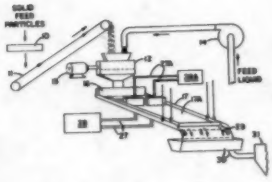
1. Vibratory tray apparatus for the treatment of a flowable slurry of a particulate material mixed in a liquid, comprising

a laterally extended and downwardly slanting elongated flat tray having upturned flange means formed along its upper end and along its lateral side edges,

suspension means dependingly supporting the tray from above for unrestrained free vibratory and undulatory flexing movement,

laterally extended header means positioned above said upper tray end, connected to receive the slurry and deliver it in a thin laterally extended stream substantially evenly distributed across the upper tray end, forming a shallow slurry layer confined by the upturned flanges of the tray and flowing along its downwardly slanted elongated length,

transducer means securely mounted on the underside of the tray to induce vibrations in the slurry at a frequency between about 10 kHz and about 50 kHz,



a generator operatively connected to energize said transducer means upon command,

and conduit means positioned to receive the flowing slurry exiting from the tray at its lower end and to deliver it to separator means for further processing,

whereby the shallow flowing slurry is exposed to vibratory energy produced by the transducer means during its flowing passage along the vibrator tray.

4,919,808

SEMIPERMEABLE MEMBRANE COMPOSITIONS

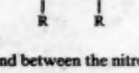
Raymond J. Swedo, Mt. Prospect, and Joseph J. Zupancic, Bensenville, both of Ill., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Oct. 21, 1985, Ser. No. 789,682

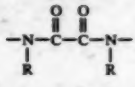
Int. Cl.[5] B01J *13/00*

U.S. Cl. 210—490 **27 Claims**

1. A semipermeable membrane composition comprising a porous support backing material having composited thereon an interfacial polymerized condensation reaction product resulting from the reaction of a hydrazine compound and an aromatic polycarboxylic acid chloride, said hydrazine compound being defined by the formula



where X may be a bond between the nitrogen atoms or defined by the formula



where R is selected from the group consisting of hydrogen, alkyl radicals having from 1 to 10 carbon atoms, aralkyl, alkaryl and cycloalkyl radicals.

4,919,809

HOLLOW FIBER MEMBRANE

Takuya Yamamoto; Fumiyoshi Fushimi, and Jyoji Nishikido, all of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jul. 18, 1989, Ser. No. 381,253

Claims priority, application Japan, Jul. 20, 1988, 63-179153; Oct. 14, 1988, 63-257080; Mar. 17, 1989, 61-63880; Jun. 6, 1989, 142222; Jun. 9, 1989, 145145; Jun. 13, 1989, 148306

Int. Cl.[5] H01D *13/01*

U.S. Cl. 210—500.23 **6 Claims**

1. A regenerated cellulose hollow fiber membrane comprising a hollow portion continuously penetrating in the direction of the fiber axis, having properties of a wet porosity of 60 to 95%, and an albumin sieving coefficient not larger than 0.15 at hemofiltration, said properties being sufficient for providing properties for the diffusion removal of substances ranging from low molecular weight substances to high-molecular weight substances.

4,919,810

POROUS MEMBRANE

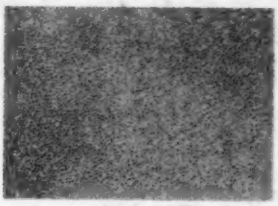
Hajime Itoh, Hiroshima; Hiroshi Takahashi, Otake; Kouji Ohbori, Otake, and Hideaki Habara, Otaka, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed May 28, 1987, Ser. No. 54,894

Claims priority, application Japan, May 30, 1986, 61-126543

Int. Cl.[5] B01D *13/04*

U.S. Cl. 210—500.34 **9 Claims**



1. A porous membrane having a surface pore density greater than 20% per unit of membrane area to enhance fluid permeability, consisting of a acrylic ester polymer or a polymer blend containing a acrylic ester polymer, wherein:

(a) said membrane has a first major surface which consists of pores extending in a direction substantially perpendicular to said membrane first major surface and are present at a surface pore density of 35 to 75%, said pores having an average pore diameter within the range of 0.01 to 10 micrometers, a ratio of major to minor axes within the range of 1.0 to 2.0, a coefficient of variation of pore diameters within the range of 0 to 50%;

(b) said membrane has another major surface which consists of a void layer which comprises voids having a diameter larger than that of said pores; and

(c) wherein the overall porosity of said porous membrane is within the range of 50 to 80%.

4,919,811

AFFINITY MEMBRANES HAVING PENDANT HYDROXY GROUPS AND PROCESSES FOR THE PREPARATION AND USE THEREOF

James C. Davis, Hudson, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Filed Jan. 14, 1988, Ser. No. 144,312

Int. Cl.[5] B01D *13/00*

U.S. Cl. 210—500.36 **6 Claims**

1. A polymeric affinity membrane comprising:

a structure for binding a preselected biological material consisting essentially of a hydrophilic precursor filtration membrane comprising a water-insoluble polymer matrix and a matrix-compatible copolymer; and

a plurality of reaction sites provided on the surface of said membrane selective to bind a specific biological material, said reaction sites being selected from the group consisting of organic adducts synthesized from hydroxyl groups supplied by said matrix-compatible copolymer.

4,919,812

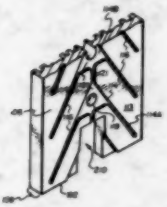
CLARIFIER ASSEMBLY

Alan R. Lasson, Salt Lake City, Utah, assignor to Baker Hughes Incorporated, Houston, Tex.

Filed Sep. 28, 1988, Ser. No. 250,441

Int. Cl.[5] B01D *43/00*

U.S. Cl. 210—519 **25 Claims**



1. A clarifier separator for use in a vessel having an inlet and an outlet for receiving a stream of mixture containing a carrier fluid and solids suspended therein, said vessel defining a flow path between said inlet and said outlet, said clarifier separator comprising:

a pair of supports positioned upright and spaced apart from each other, at least one of said supports having a plurality of generally inverted "V"-shaped recesses defined within an exterior surface and along a height of said support, each said recess including a bottom and two sidewalls, one of said supports having a pair of spacedly positioned, elongate flange-like members mounted thereon defining an elongate, open-ended channel therebetween which extends along a height of said support, said channel fitted support defining a plurality of openings therein;

a plurality of lengthwise elongate carrier chambers, each of said carrier chambers having a sidewall and two opposing open ends, said sidewall defining a hollow interior channel and at least one orifice which communicates with said hollow interior channel, each said carrier chamber having a generally inverted "V"-shaped flow-directing member, said interior channel being defined proximate an apex region of said "V"shaped flow-directing member, each said flow-directing member having wing members which extend outwardly from said interior channel, each said carrier chamber being mounted to each said support thereby extending between said supports, at least one of said ends of each chamber including an end of each of its said wing members being positioned within a respective said recess, each said support opening communicating with a said interior channel of a said carrier chamber;

a plurality of projecting tubular extensions, each of said extensions being sealedly mounted on said channel fitted support circumscribing a respective support opening and extending outwardly into said open-ended channel to form a solid walled conduit communicating with a respective support opening; and

an elongate strip having a plurality of apertures therein, said strip being positioned within said open-ended channel of said support, each said aperture of said strip being positioned to register with a respective opening of said channel fitted support, wherein said tubular extensions are positioned between said strip and said channel fitted sup-

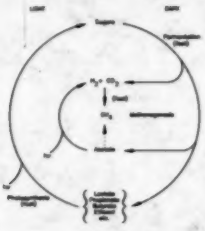
port to form a sealed solid-walled conduit between each such support opening and a respective strip aperture.

4,919,813

PHOTOENHANCED ANAEROBIC DIGESTION OF ORGANIC ACIDS

Paul F. Weaver, Golden, Colo., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Aug. 25, 1989, Ser. No. 398,604
Int. Cl.[5] C02F 3/28
U.S. Cl. 210—603 **19 Claims**



1. A method for converting organic acids or alcohols to hydrogen and carbon dioxide under anaerobic conditions in an aqueous medium comprising the steps of:

(a) adding to said medium photosynthetic bacteria; and

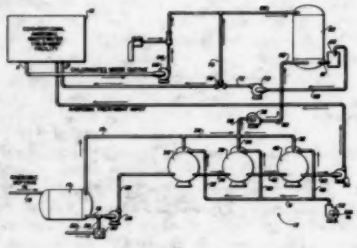
(b) exposing said bacteria to radiant energy for a time sufficient to cause said bacteria to convert said acids or alcohols to hydrogen and carbon dioxide.

4,919,814

SYSTEM AND METHOD FOR TREATING WASTEWATER COLLECTED FROM SEPTIC TANKS AND SIMILAR INSTALLATION

Robert P. Carnahan, and Robert J. Murphy, both of Temple Terrace, Fla., assignors to Hydro Systems, Inc., Tampa, Fla.

Filed Apr. 13, 1989, Ser. No. 337,264
Int. Cl.[5] B01D 3/30
U.S. Cl. 210—603 **13 Claims**



1. A method for treating anaerobic wastewater collected from septic tanks for rendering the anaerobic wastewater suitable for input into a conventional aerobic wastewater treatment facility, the method comprising the steps of:

placing the anaerobic wastewater into a reactor tank;

treating the anaerobic wastewater with an oxygen-containing fluid while in the reactor tank so as to substantially increase the dissolved oxygen content in the wastewater and thereby render the wastewater aerobic;

drawing off volatile gases from the reactor tank and placing the gases in a treatment tank;

treating the volatile gases to reduce the bacterial and odor level; and

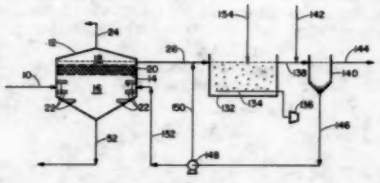
pumping the converted aerobic wastewater into the head end of an aerobic wastewater treatment facility.

4,919,815

TWO-STAGE ANAEROBIC/AEROBIC TREATMENT PROCESS

William M. Copa, Wausau, and Thomas J. Vollstedt, Schofield, both of Wis., assignors to Zimpro/Passavant Inc., Rothschild, Wis.

Filed Feb. 6, 1989, Ser. No. 306,195
Int. Cl.[5] C02F 3/30
U.S. Cl. 210—603 **27 Claims**



1. A two-stage process for treating wastewater containing a COD of 5,000–50,000 mg/l comprising the steps;

(a) contacting said wastewater with anaerobic biosolids and powdered adsorbent in an anaerobic first treatment zone to form an anaerobic mixed liquor and remove a substantial portion of the COD from said wastewater;

(b) separating a fuel gas from said anaerobic mixed liquor within said first treatment zone;

(c) separating a substantial portion of the anaerobic biosolids and powdered adsorbent from said anaerobic mixed liquor by separating means within said first treatment zone to produce a first solids phase and a first aqueous phase;

(d) transferring said first aqueous phase from said first treatment zone to a second aerobic treatment zone.

(e) aerating and mixing said first aqueous phase with an oxygen-containing gas in said second treatment zone containing aerobic mixed liquor solids, composed of aerobic biosolids and powdered adsorbent, to remove a substantial portion of the remaining COD from said first aqueous phase;

(f) separating said aerobic mixed liquor solids from said thus-treated liquid to produce a second settled solids phase and a second aqueous phase;

(g) discharging said second aqueous phase to the environment or to reuse;

(h) transferring a portion of the second settled solids phase from the second treatment zone to the first treatment zone, thereby maintaining the desired concentration of aerobic biosolids and powdered adsorbent within the second treatment zone;

(i) adding sufficient powdered adsorbent to said second treatment zone to compensate for powdered adsorbent transferred to said first treatment zone in step (h); and

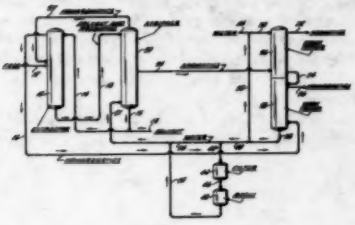
(j) removing a sufficient amount of anaerobic mixed liquor from said first treatment zone to control solids concentration therein.

4,919,816

REMOVAL OF ACIDIC IMPURITIES IN PROCESSES FOR SOLVENT EXTRACTION OF AROMATICS FROM NONAROMATICS

Hsiang-Wei Tsao, West Chester, Pa., assignor to Sun Refining and Marketing Company, Philadelphia, Pa.

Filed Jan. 31, 1989, Ser. No. 304,090
Int. Cl.[5] B01D *11/04*; C02F *1/42*
U.S. Cl. 210—638 4 Claims



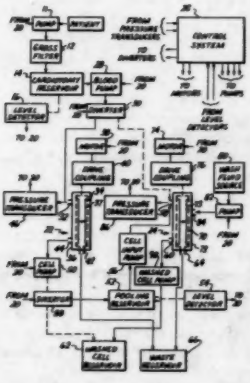
1. In a process wherein aromatics are extracted from nonaromatics by a selective solvent, extracted aromatics are separated from the bulk of the solvent and washed with water in a washing zone to remove residual solvent, and said water is withdrawn from said washing zone, the improvement which comprises reducing corrosion in the system by contacting said water after said withdrawal with an anion exchange resin to remove acidic components.

4,919,817

BLOOD CELL WASHING SYSTEMS AND METHODS

Donald W. Schoendorfer, Santa Ana, and Lee H. Williamson, Huntington Beach, both of Calif., assignors to Baxter International Inc., Deerfield, Ill.

Continuation of Ser. No. 895,505, Aug. 11, 1986, abandoned.
This application Feb. 18, 1988, Ser. No. 159,446
Int. Cl.[5] B01D *13/00*
U.S. Cl. 210—639 24 Claims



10. A method of washing shed blood constituents to derive red cell concentrate comprising the steps of:

passing the blood constituents in a Couette flow, having Taylor vortices, longitudinally along a gap area bordered by a filter membrane having a pore size of less than about 1.2 microns;

feeding a wash solution capable of passing through the pores of the filter membrane into the Taylor vortices at a rate which is at least about twice greater than the flow rate of the blood constituents; and

filtering foreign matter of less than about 1.2 microns size together with the wash solution from the blood constituents at downstream portions of said filter membrane.

4,919,818

PROCESS FOR EXTRUDING AND TREATING CLAY FOR IMPROVED FILTRATION

William Alexander, Naperville, Ill., assignor to American Colloid Company, Arlington Heights, Ill.

Division of Ser. No. 7,713, Jan. 28, 1987, Pat. No. 4,847,226.
This application Mar. 6, 1989, Ser. No. 319,119
The portion of the term of this patent subsequent to May 23, 2006, has been disclaimed.
Int. Cl.[5] B01D *15/00*
U.S. Cl. 210—660 15 Claims

1. A method of removing oil-soluble colorant compounds from oil comprising:

extruding clay through one or more die openings;

grinding the extruded clay prior to adding the clay to an aqueous acid solution;

adding the extruded clay to an aqueous acid solution to form a clay slurry;

agitating the clay slurry for a time sufficient and at a temperature sufficient so that the acid interacts with the clay to beneficiate the contaminant filtration characteristics of said clay to form an acid treated clay;

separating the acid treated clay from a majority of the acid solution;

washing the acid treated clay with a suitable acid-diluting liquid to remove most of the acid solution from the clay and form a washed, acid treated clay;

filtering the washed, acid treated clay to remove a portion of the diluting liquid from the clay;

drying the acid treated clay to a liquid content less than about 20% by weight;

adding the extruded, acid treated clay to oil containing oil soluble colorant compounds for a time sufficient for the clay to absorb some of the colorant compounds from the oil; and

separating the clay from the oil.

4,919,819

METHOD FOR REMOVING AND DECOMPOSING HYDROCARBON COMPOUNDS FROM WATER CONTAMINATED THEREWITH

Marguerite Robinson, Malvern, and Manuel Holcomb, Carlisle, both of Ark., assignors to Gem, Inc., Little Rock, Ark.

Continuation-in-part of Ser. No. 227,192, Aug. 3, 1988, abandoned. This application Feb. 6, 1989, Ser. No. 307,536
Int. Cl.[5] B01D *15/00*; C02F *1/28*
U.S. Cl. 210—662 18 Claims

1. A purification process for removing toxic hydrocarbon compounds from waste water, said process comprising the steps of:

(a) creating a slurry mixture from rehydratable alumina and a predetermined quantity of said waste water causing said hydrocarbon compounds to be adsorbed on the surface of said alumina;

(b) after adsorption, filtering the slurry mixture of step (a) to yield treated water and contaminated alumina;

(c) monitoring the quality of said treated water;

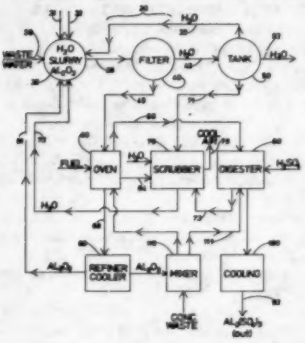
(d) subjecting said contaminated alumina to a high-temperature oven to recover recyclable alumina while concurrently separating and substantially incinerating waste gases;

(e) scrubbing all waste gases remaining after said step (d);

(f) when said water monitored in accordance with step (c) achieves a desired predetermined purity, returning said recyclable alumina of step (d) for slurrying in accordance with step (a); and,

(g) when water monitored in accordance with step (c) fails to achieve said desired predetermined purity, digesting the alumina outputted by step (d) to yield a disposable aluminum compound.

17. A process for converting concentrated contaminated toxic hydrocarbon compounds which have been separated from a watse phase by other extractive methods to non-hazardous waste, said process comprising the steps of:



(a) mixing a predetermined quantity of said contaminated hydrocarbon compounds with rehydratable alumina in a mixer;

(b) chemically treating the mixture produced by step (a) in a high temperature and pressure digester wherein the hydrocarbon compounds are decomposed and converted to non-toxic compounds in a pressure bath of sulfuric acid at a temperature of 200–400 degrees C., and at a pressure of between 800–1000 PSI.

4,919,820

OIL ABSORPTION METHOD

William T. Lafay, 2629 Manhattan Ave., Hermosa Beach, Calif. 90254, and William F. Meistrell, 669 Seventeenth St., Manhattan Beach, Calif. 90266

Filed Apr. 17, 1989, Ser. No. 339,259

Int. Cl.[5] C02F *1/28*; E02B *15/04*

U.S. Cl. 210—671 **3 Claims**

1. The method of removing oil from a body of water that includes:

(a) providing multiple flexible mesh containers, and filling duck feathers into each container, the mesh size of the container being about 3/16 inch, the duck feathers packed against the mesh at the inside of the container, and interconnecting said containers in series and connecting float means to the series of containers, in series therewith,

(b) introducing the feather filled mesh containers into the water body for deployment into contact with the oil near or at the surface of the water body, and advancing the series of containers as a front, toward and into an oil slick on the body of water,

(c) allowing absorption of the oil through the mesh into the feathers in each container,

(d) removing each container from the body of water, for disposition of the absorbed oil,

(e) and including squeezing each container and feathers therein to separate oil from the feathers, and collecting the separated oil,

(f) and including reusing said feather-filled containers from which oil has been squeezed, by reintroducing the series of containers into oil at or near the surface of the water body for oil absorption by the feathers, and again removing the containers from the body of water for disposition of the absorbed oil,

(g) each container provided to be between 12 and 24 inches long, and between 24 and 40 inches wide.

4,919,821

MODIFIED MALEIC ANHYDRIDE POLYMERS AND THE LIKE FOR USE AS SCALE INHIBITORS

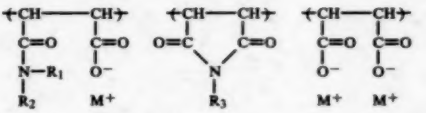
Dodd W. Fong; John E. Hoots; Donald A. Johnson, all of Naperville, and James Kneller, LaGrange Park, all of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Division of Ser. No. 934,598, Nov. 25, 1986, Pat. No. 4,801,388, which is a continuation-in-part of Ser. No. 842,568, Mar. 21, 1986, abandoned. This application Aug. 31, 1988, Ser. No. 239,137

Int. Cl.[5] C02F *5/12*

U.S. Cl. 210—698 **6 Claims**

1. A method of controlling scale deposits by adding to waters having a tendency to form scale, a scale-inhibitorily effective amount of a derivatized maleic anhydride polymer having N-substituted maleamic units, N-substituted maleimide units and maleic acid (and salts) units, said units having respectively structures as follows:



wherein R_1, R_2 and R_3 are each independently chosen from the group consisting of hydrogen, sulfonic acid substituted phenyl, and linear or branched sulfonic acid substituted alkyl of from one to ten carbon atoms and combinations thereof, wherein at least one of R_1, R_2 and R_3 is sulfophenyl or sulfoalkyl, and wherein M^+ is H^+, alkali metal ion, alkaline earth metal ion, ammonium ion or zinc ion, and wherein the total moles of N-substituted maleamic units, N-substituted maleimide units and maleic acid (and salts) units in said derivatized maleic anhydride polymer is n, wherein n is a number in the range of from 10 to about 1200,

wherein the total moles of said N-substituted maleamic units in said derivatized maleic anhydrided polymer is xn, wherein x is a number from about 0.5 to about 0.95 and n is as defined above;

wherein the total moles of said N-substituted maleimide units in said derivatized maleic anhydride polymer is yn, wherein y is a number from about 0.05 to about 0.95, and n is as defined above;

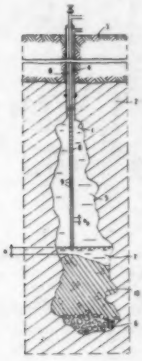
wherein the total moles of said maleic acid and salts units in said derivatized maleic anhydride polymer is zn, wherein z is a number from about 0.05 to about 0.95 and n is as defined above; and

wherein $x+y+z=1$.

4,919,822
METHOD OF CONFINING WASTES UNDERGROUND IN A CAVITY LEACHED OUT OF SALT

Alain Boulanger, Levallois-Perret, France, assignor to Geostock S.A.R.L. and ESYS S.A., France

Filed Dec. 12, 1988, Ser. No. 282,798
Claims priority, application France, Dec. 11, 1987, 8717347
Int. Cl.[5] B65G 5/00
U.S. Cl. 210—747 10 Claims



1. A method of geologically confining toxic industrial waste, the method comprising:

using a cavity previously leached from a mass of rock salt, said cavity being initially filled with brine;

incorporating said waste in a pumpable waste-containing mixture of density greater than the density of said brine which is prepared so that setting occurs once said waste is inserted in said cavity;

inserting a predetermined quantity of a buffer liquid into the bottom of said cavity by means of a dip tube positioned in a well so as to establish a communication with a portion of the brine between the ground surface and the bottom of the cavity, the buffer liquid being immiscible both with said brine and with said waste-containing mixture, the density of the buffer liquid lying between the density of said brine and the density of said waste-containing mixture, and the buffer liquid including one or more halogen-containing solvents;

inserting said waste-containing mixture into said cavity by means of said dip tube while the bottom end of said dip tube is maintained within said previously inserted buffer liquid; and

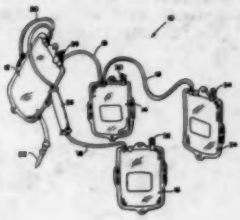
removing said brine at the surface as it is displaced by said waste-containing mixture being inserted into said cavity.

4,919,823
BLOOD BAG SYSTEM WITH INTEGRAL FILTERING MEANS

Leonard A. Wisdom, West Pymble, Australia, assignor to Miles Inc., Elkhart, Ind.

Continuation of Ser. No. 864,229, May 19, 1986, Pat. No. 4,767,541, which is a division of Ser. No. 385,167, Jun. 4, 1982, Pat. No. 4,596,657. This application Jul. 25, 1988, Ser. No. 223,977
The portion of the term of this patent subsequent to Aug. 30, 2005, has been disclaimed.
Int. Cl.[5] B01D 21/26, 36/00
U.S. Cl. 210—749 6 Claims

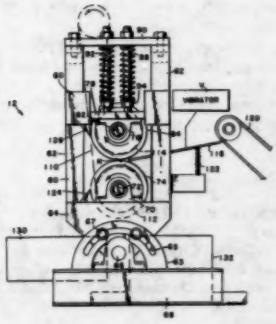
1. A method for filtering a red cell concentrate in a closed multiple blood bag system consisting of at least two blood bags and an intermediate filtering means, the method comprising the steps of providing a first blood bag having in closed sealed flow communication therewith an integral filtering means, the blood bag containing an aqueous solution which can be passed through the filtering means into a second bag containing a red cell concentrate, contacting the filtering means with the aqueous solution by passing it from the first bag to the second bag prior to filtration of the red cell concentrate and then passing the red cell concentrate and the solution through the filtering means by gravity.



4,919,824
ROLLER/SQUEEZSER DELIQUIFIER

John L. Creps, Rudolph, and Matthew O. Kelley, Findlay, both of Ohio, assignors to Henry Filters, Inc., Bowling Green, Ohio

Filed Jun. 29, 1988, Ser. No. 213,226
Int. Cl.[5] B30B 9/20
U.S. Cl. 210—770 21 Claims



1. A method for deliquifying machine tool swarf having liquid entrained therewith comprising the steps of:

passing the swarf into the nip of a pair of rollers;

said rollers having centers disposed along a vertical axis;

pressing at least one roller toward the other roller along the vertical axis to exert pressure on the swarf entering the nip;

pulling the swarf through the nip of the roller such that the rollers squeeze the swarf separating the swarf from the liquid entrained therein thereby producing deliquified swarf;

removing the deliquified swarf passed through the nip from the rollers;

collecting the deliquified swarf; and

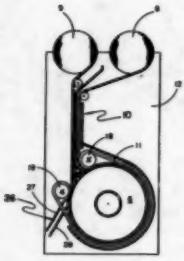
collecting the liquid.

4,919,825

FILTER APPARATUS AND METHOD FOR SEPARATING CONTAMINANTS FROM LIQUIDS

Frank M. Croket, Jefferson County, Ky., assignor to Hallco Fabricators, Inc., Louisville, Ky.

Filed Mar. 20, 1989, Ser. No. 325,867
Int. Cl.[5] B01D *33/02, 33/12*
U.S. Cl. 210—783 **23 Claims**



17. A method of separating contaminants from liquids comprising:

passing said contaminated liquids through a flow-through liquid treating zone having a perforated filter media support journaled for rotation and at least partially disposed and submerged therein;

passing and guiding filter media by means including a longitudinally extending guide assembly to enter into said liquid treating zone around and in optimum contact with the greater portion of said perforated support, and then exit from said liquid treating zone with the filter media engaging and leaving said perforated support in guided proximate, closely spaced substantially parallel, vertical planes;

sealing any unsubmerged portion of said perforated support and that portion not contacted by the guided filter media from fluid passage therethrough; and,

pumping filtered liquid from said submerged filtering zone to a preselected location remote from said liquid treating zone.

4,919,826

PROCESS AND APPARATUS FOR SEPARATING SOLIDS AND LIQUIDS FROM AN EFFLUENT STREAM

Edgar Alzner, Garden City, N.Y., assignor to Air Techniques, Incorporated, Hicksville, N.Y.

Filed Dec. 20, 1988, Ser. No. 287,987
Int. Cl.[5] A61C *17/04*; B01B *49/12*; B01D *21/00*
U.S. Cl. 210—788 **11 Claims**

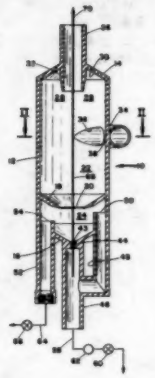
9. A process for separating a multi-component stream comprising water, gases, lighter than water particles and heavier than water particles, which comprises:

introducing said multi-component stream into a cylindrically-shaped gas-liquid separation zone to form a gaseous stream and a liquid stream including particles;

introducing said liquid stream including particles into a liquid-liquid separation zone including a pool of liquid disposed below said gas-liquid separation zone and separated therefrom by an intermediate plate member extending into said zone;

withdrawing a liquid stream including lighter than water particles overflowing said pool of liquid and shielded by said intermediate plate member;

withdrawing a liquid stream which is relatively free of particles from an intermediate of said pool of liquid and shielded by said intermediate plate member; withdrawing a liquid stream including heavier than water particles from a lower portion of said pool of liquid; and



controlling flow of liquid from said liquid-liquid separation zone to establish said pool of liquid.

4,919,827

MULTICOMPONENT ORGANIC LIQUID AND USE THEREOF IN TREATING WELLS AND SUBTERRANEAN FORMATIONS

Susan D. Harms, Houston, Tex., assignor to Amoco Corporation, Chicago, Ill.

Filed May 5, 1988, Ser. No. 187,637
Int. Cl.[5] E21B *43/27*
U.S. Cl. 252—8.553 **25 Claims**

16. A high flash point multicomponent liquid consisting of ethylene glycol monobutyl ether, hereinafter referred to as EGMBE, and octyl alcohol in an amount in the range of about 5 to about 20 percent by weight of the multicomponent liquid, optionally in a mixture of C_6–C_{10} alcohols, and isopropyl alcohol up to about 10 weight percent based on the total weight of said multicomponent liquid, and an organic liquid selected from the group consisting of benzene, toluene, xylene, and alkylated naphtha dissolved in kerosene, in proportions effective for having a flash point of at least about 100° F. and for forming a substantially clear single phase solution with aqueous acid comprising 5–30% by weight of acid selected from the group consisting of hydrochloric acid, formic acid, acetic acid, and hydrofluoric acid, said multicomponent liquid being substantially free of surfactant.

4,919,828

FIBER LUBRICANTS CONTAINING HIGH MOLECULAR WEIGHT POLYACRYLAMIDO ALKANE SULFONIC ACID ADDITIVES

John Childers, Monroe, N.C., assignor to Henkel Corporation, Ambler, Pa.

Continuation of Ser. No. 115,234, Oct. 30, 1987, abandoned. This application Apr. 10, 1989, Ser. No. 336,589
Int. Cl.[5] D06M *15/00*
U.S. Cl. 252—8.75 **22 Claims**

1. A fiber lubricant consisting essentially of a low-friction lubricating component and an acrylamido-C_1–C_6-alkane sulfonic acid polymer or salt thereof having an average molecular weight of at least about 500,000.

4,919,829

ALUMINUM HYDROXIDES AS SOLID LUBRICANTS

Richard S. Gates, Germantown, and Stephen M. Hsu, Gaithersburg, both of Md., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Dec. 30, 1988, Ser. No. 292,176
Int. Cl.[5] C10M *173/02, 103/06*
U.S. Cl. 252—25 21 Claims

A

B

1. A lubricant for lubricating aluminum oxide layers, aluminum containing materials, ceramics and other oxide materials consisting essentially of one member selected from the group consisting of aluminum oxide hydroxides and aluminum trihydroxides dispersed in water and present in a concentration of up to about two percent by weight.

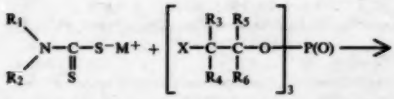
4,919,830

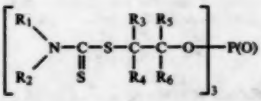
DITHIOCARBAMATE-DERIVED PHOSPHATES AS ANTIOXIDANT/ANTIWEAR MULTIFUNCTIONAL ADDITIVES

Liehpao O. Farng, Lawrenceville, and Andrew G. Horodysky, Cherry Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 30, 1988, Ser. No. 292,064
Int. Cl.[5] C10M *137/04*
U.S. Cl. 252—327 E 33 Claims

1. A N,N-dihydrocarbyl dithiocarbamate-derived organic phosphate product of reaction prepared as in the following generalized equation:





where R_1 and R_2 are each individually hydrogen or C_1 to about C_{60} hydrocarbyl, R_3, R_4, R_5 and R_6 are each individually hydrogen or C_1 to about C_{30} hydrocarbyl and each of said R_1, R_2, R_3, R_4, R_5 and R_6 can optionally contain sulfur, nitrogen and/or oxygen; M^+ represents the cationic moiety of the dithiocarbamate salt and X is halide selected from chloride, bromide or iodide.

4,919,831

MULTIFUNCTIONAL ESTER-TYPE ADDITIVES

Andrew G. Horodysky, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 11, Jan. 2, 1987, abandoned. This application Sep. 30, 1988, Ser. No. 253,306
Int. Cl.[5] C10M *135/12*
U.S. Cl. 252—47.5 11 Claims

1. A composition comprising an oil of lubricating viscosity or grease prepared therefrom and a minor dispersant/detergent and/or antioxidant amount of an additive consisting of a polymeric, oligomeric or hydrocarbyl ester containing intergral sulfur-ester moieties prepared by reacting (1) a polycarboxylate ester made by the reaction of a C_{20} to about a C_{200} alkyl succinic anhydride or acid and a polyol having from about 6 to about 30 carbon atoms and from about 3 to about 6 hydroxyl groups, and containing at least one free hydroxyl group and having at least about 30 carbon atoms and (2) a sulfur-containing carboxylic acid or carboxylic acid generating species selected from the group consisting of thiodipropionic acid, dithiopropionic acid, thiodibutanoic acid, anhydrides thereof or mixtures thereof in a polymeric, oligomeric or hydrocarbyl ester to sulfur species molar ratio of from about 1:1 to about 1:0.001 at temperatures of from about 80° to about 200° C.

4,919,832

N-SUBSTITUTED TETRAHYDROQUINOLINES FOR USE AS ANTIOXIDANTS IN LUBRICANTS

Hans R. Meier, and Samuel Evans, both of Marly, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

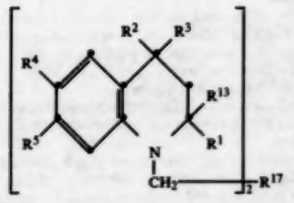
Division of Ser. No. 135,964, Dec. 21, 1987, Pat. No. 4,828,741. This application Feb. 2, 1989, Ser. No. 305,037
Int. Cl.[5] C10M *133/40*
U.S. Cl. 252—50 3 Claims

1. A composition which comprises

(a) at least one lubricant, hydraulic oil or metal-working fluid based on mineral oil or synthetic oil, and

(b) 0.05–5% by weight, based on the total weight of the lubricant, hydraulic oil or metal-working fluid composition, of at least one compound of formula V

(V)



in which R^1 and R^2 are independently of each other C_1–C_8-alkyl, unsubstituted or C_1–C_{12}-alkyl-, Cl-, Br-, I-, NO_2-, OH- or C_1–C_{12}-alkoxy-substituted phenyl or naphthyl, or benzyl, R^3 is hydrogen or methyl, R^4 and R^5 are independently of each other hydrogen, methyl, methoxy, -Cl or -NO_2, R^{13} is hydrogen or methyl, and R^{17} is —C_xH_{2x}—, where x is 0 to 10, or R^{17} is —CH=CH—.

4,919,833

FUNCTIONAL FLUIDS

Peter Miles, Stockport, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 9, 1988, Ser. No. 192,054
Claims priority, application United Kingdom, May 21, 1987, 8712091; Feb. 17, 1988, 8803645
Int. Cl.[5] C10M *105/56, 125/20, 133/02*
U.S. Cl. 252—77 7 Claims

1. A functional fluid comprising:

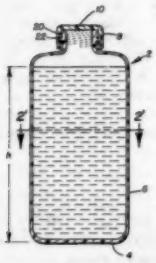
(a) a base fluid selected from one or more of (i) a phosphate fluid and (ii) a carboxylic acid ester; and
(b) as hydrolytic stabiliser phenylurea.

4,919,834

PACKAGE FOR CONTROLLING THE STABILITY OF A LIQUID NONAQUEOUS DETERGENT

Loren Chen, Pleasanton; Gregory van Buskirk, Danville; David Peterson, Pleasanton, and Robert J. Iliff, Oakley, all of Calif., assignors to The Clorox Company, Oakland, Calif.

Filed Sep. 28, 1988, Ser. No. 251,646
The portion of the term of this patent subsequent to Oct. 17, 2006, has been disclaimed.
Int. Cl.[5] C11D *1/66, 3/34, 17/04, 17/08*
U.S. Cl. 252—90 **8 Claims**



1. A package for a phase stable, liquid nonaqueous detergent composition, comprising:
a plastic, relatively thin-walled container, said container having an end wall and a circumscribing side wall which narrows to a finish, and a liquid detergent composition contained in said container, said detergent composition comprising:
(a) 20–90% of a liquid portion which comprises an alkoxylated nonionic surfactant;
(b) 5–50% of a solids portion which comprises:
(i) a builder;
(ii) 0–20% of an oxidant; said solids being stably suspended in said liquid portion, by means of
(c) 0.5–20% of a sulfonated, lower alkylated condensed ring aryl compound; and
(d) 0–5% of a hydrolytic enzyme;
whereby the phase stability of said liquid detergent composition in storage in said container is controlled, by the selection of either:
(1) said container being constructed of a homopolymeric resin, said container having a minimum average cross-sectional dimension r/2 of at least about 6.8 millimeters in order to minimize interaction with said plastic;
(2) said container being constructed of a heteroatom-containing polymer; or
(3) a combination thereof.

4,919,835

POWDER-COATED LAUNDRY DETERGENT SHEET

Wayne C. Sigl, Neenah, and Frank C. Murray, Appleton, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed May 3, 1988, Ser. No. 189,934
Int. Cl.[5] C11D *11/00, 17/00, 17/02, 17/06*
U.S. Cl. 252—91 **17 Claims**

1. A cleaning product comprising a nonwoven web containing at least 1 gram of active liquid detergent solids per gram of untreated base web, said active liquid detergent solids being selected from the group consisting of anionic, nonionic, cationic, and amphoteric surfactants, and said nonwoven web having a surface coating of at least one dry powdered detergent ingredient selected from the group consisting of sodium citrate, a salt of ethylenediaminetetraacetic acid, and carboxymethyl cellulose.

4,919,836

PROCESS FOR THE PREPARATION OF DIPEROXYDODECANEDIOIC ACID-CONTAINING AGGLOMERATES AND COMPOSITIONS IN WHICH THESE AGGLOMERATES ARE USED AS BLEACHING COMPONENT

John Meijer, Deventer; Reinder Torenbeek, Terwolde, and Rolf H. van den Berg, Kring Van Dorth, all of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

Continuation of Ser. No. 51,752, May 20, 1987, Pat. No. 4,818,425. This application Nov. 10, 1988, Ser. No. 269,595
Claims priority, application Netherlands, May 28, 1986, 8601361; Jan. 19, 1987, 8700107
Int. Cl.[5] C11D *3/395;* **C01B** *15/00;* **C07C** *179/10*
U.S. Cl. 252—94 **15 Claims**

1. Shaped particles containing agglomerates obtained by the successive steps of agitating an aqueous suspension of 1,12-diperoxydodecanedioic acid in the presence of a water-impermeable material which is solid at room temperature in an amount of at least 25% by weight and at most 100% by weight, calculated on the acid, for a time sufficient to agglomerate the suspended acid particles and at a temperature above the melting point of the water-impermeable material and below the decomposition temperature of the acid, cooling with continued agitation of the suspension of the agglomerated particles thus obtained to a temperature at which the water-impermeable material turns solid, and isolating the resulting agglomerates and a hydratable material which is non-alkaline in aqueous solution.

4,919,837

ANTISEPTIC CLEANSING COMPOSITION COMPRISING A WATER-SOLUBLE SALT OF CHLORHEXIDINE

Bruno A. Gluck, 20 King Avenue, Balgowlah, New South Wales 2093, Australia

PCT No. PCT/AU85/00238, § 371 Date May 23, 1986, § 102(e) Date May 23, 1986, PCT Pub. No. WO86/02090, PCT Pub. Date Apr. 10, 1986
PCT Filed Sep. 24, 1985, Ser. No. 876,876
Claims priority, application Australia, Sep. 26, 1984, PG7325
Int. Cl.[5] C11D *1/72*
U.S. Cl. 252—106 **13 Claims**

1. An antibacterial composition comprising a water-soluble salt of chlorhexidine, a nonionic surfactant and an inert diluent or carrier wherein the nonionic surfactant is at least one compound having the formula

$$R—O—(—CH_2CH_2O—)_nH$$

wherein R is the residue of an alkylphenol or a fatty alcohol and n is a number sufficiently high to assure water solubility between ambient temperatures and 45° C., the chlorhexidine salt being present at a concentration of from 0.1 to 10.0% w/v and the nonionic surfactant being present at a concentration of not greater than 25% w/v wherein the weight ratio of the chlorhexidine salt to the nonionic surfactant is not more than 1:7, and the composition does not contain a polyoxyethylene-polyoxypropylene condensate or an amphoteric surfactant.

4,919,838

BAR SHAMPOO AND SKIN SOAP

Hubert M. Tibbetts, 137 Pecksland Rd., Greenwich, Conn. 06830, and Mukat Gupta, South Burlington, Vt., assignors to Hubert M. Tibbetts, Greenwich, Conn.

Filed Sep. 30, 1988, Ser. No. 252,167
Int. Cl.[5] C11D 9/00, 15/00; A61K 7/06
U.S. Cl. 252—117 28 Claims

1. A composition suitable for molding into a solid product useful both as a shampoo for the hair or scalp and as a cleansing agent for the skin or body comprising:

(A) from about 70% to about 90% by weight of the composition of a soap base selected from a natural soap base or a mixture of a natural soap base and a synthetic detergent soap base wherein the synthetic detergent soap base may be present in an amount up to about 60% by weight based on the combined weight of the natural and synthetic detergent soap bases, and

(B) from about 5 to about 25% by weight of the composition of:

(1) a compound selected from the group consisting of disodium lauryl sulfosuccinate, sodium cocyl isethionate or sodium lauryl sulfate, and

(2) a compound selected from the group consisting of cocoamide monoethanolamide, cocoamide diethanolamide or lauramide diethanolamide,

wherein the weight ratio of the compounds from Components (1) and (2) in the composition is about 3:2.

4,919,839

LIGHT DUTY MICROEMULSION LIQUID DETERGENT COMPOSITION CONTAINING AN ANIOCIC/CATIONIC COMPLEX

Patrick Durbut, Verviers, Belgium; Ammanuel Mehreteab, Piscataway, N.J.; Myriam Mondin, Seraing, and Guy Broze, Grace-Hollogne, both of Belgium, assignors to Colgate Palmolive Co., Piscataway, N.J.

Filed Feb. 21, 1989, Ser. No. 313,664
Int. Cl.[5] C11D 1/65, 3/43, 17/08, 11/00
U.S. Cl. 252—153 6 Claims

1. A light duty microemulsion liquid detergent composition which is useful for removal of greasy soils from substrates, both in neat form and when diluted with water, which comprises 1 to 10% of a complex of sodium C_{12-18} alkyl diethoxy ether sulfate and C_{12-14} alkyl-bis(2-hydroxyethyl) methylammonium halide, in which such anionic and cationic surfactants are in essentially equivalent proportions, 20 to 40% of an anionic detergent, which is a mixture of sodium C_{12-18} paraffin sulfonate and sodium C_{12-18} alkyl diethoxy ether sulfate, in which the proportion of such paraffin sulfonate to such alkyl diethoxy ether sulfate is in the range of 2:1 to 4:1, 1 to 5% of a co-solvent which is dipropylene glycol monomethyl ether, 1 to 5% of an organic solvent which is a C_{10-12} isoparaffin, and 30 to 70% of water, in which composition the ratio of anionic detergent to complex is in the range of 2:1 to 25:1.

4,919,840

UNCLOUDED METALS PASSIVATION ADDITIVE

Ernest B. Boston, Borger, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 151,356, Feb. 2, 1988, Pat. No. 4,830,730. This application Feb. 16, 1989, Ser. No. 311,487
Int. Cl.[5] C10G 11/00
U.S. Cl. 252—182.3 29 Claims

1. A composition comprising an antimony hydroxyhydrocarbylthiolate and a compound of the formula $NR_1R_2R_3$ where R_1, R_2 and R_3 may be the same or different and are selected from the group consisting of hydrogen, alcohol, alkyl, alkenyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, aralkyl and alkenylaryl.

16. A process for making a metals passivation additive which comprises reacting an antimony oxide with a hydroxyhydrocarbylthiol in the presence of a compound of the formula $NR_1R_2R_3$ where R_1, R_2 and R_3 may be the same or different and are selected from the group consisting of hydrogen, alcohol, alkyl, alkenyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, aralkyl and alkenylaryl.

4,919,841

WAX ENCAPSULATED ACTIVES AND EMULSION PROCESS FOR THEIR PRODUCTION

Ahmed Kamel, Valley Cottage, N.Y.; Lisa C. Hurckes, Short Hills, and Monica M. Morelli, North Arlington, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Filed Jun. 6, 1988, Ser. No. 202,853
Int. Cl.[5] B01J 13/02; C07D 251/00; B32B 27/14; C01B 15/00
U.S. Cl. 252—186.26 9 Claims

1. A process for preparing particles of encapsulated active material comprising:

(i) selecting a mixture of waxes wherein one wax of said mixture has a melting point different from another of said waxes, said mixture having a melting point between 50°–80° C., and melting said mixture to obtain a melted wax;

(ii) dispersing said active material in said melted wax to form an active material/wax dispersion, said active material being selected from the group consisting of chlorine or oxygen bleaching agents and bleach precursors;

(iii) adding said dispersion to water containing at least one surfactant and emulsifying the active material/wax dispersion for no longer than 4 minutes therein to form capsules;

(iv) cooling immediately thereafter said capsules;

(v) retrieving said cooled capsules from said water; and

(vi) annealing said retrieved capsules for a period between 4 and 24 hours.

4,919,842

CHEMICAL FOR BLEACHING TEXTILES

Glen A. Dickson, and Donnie R. Gray, both of P.O. Box 18006, Dilley, Tex. 78017

Division of Ser. No. 117,664, Nov. 5, 1987. This application Feb. 1, 1989, Ser. No. 269,890
Int. Cl.[5] D06L 3/00
U.S. Cl. 252—186.43 6 Claims

1. A method for preparing a powdered bleaching composition for fading a dyed denim fabric comprising the steps of:

first mixing a first batch by combining a first diatomaceous earth powder carrier and a dry potassium permanganate bleaching agent;

second mixing of the first batch with a liquid, wherein the liquid is water, the liquid of said second mixing being added in an amount not greater than the maximum amount that can be added while still maintaining a powder consistency to the first batch; and

third mixing the first batch after all the liquid has been added, said third mixing continued until the liquid is uniformly distributed throughout the first batch.

4,919,843

ANTIFOAM COMPOSITIONS

Ernst Isnertsberger, Burghausen; Jakob Schmidlkofer, Mehring-Öd; Peter Huber, Burghausen; Willibald Burger, Burghausen, and Joachim Schulze, Burghausen, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Jul. 22, 1988, Ser. No. 222,866

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1987, 3725322

Int. Cl.[5] C09K 13/00

U.S. Cl. 252—358 7 Claims

1. An antifoam composition containing (a) an essentially linear organopolysiloxane, (b) a silicone resin, consisting essentially of traiorganosiloxy and $SiO_{4/2}$ units, and (c) a filler, in which at least part of the essentially linear organopolysiloxane contains SiC-bonded monovalent hydrocarbon radicals, and SiOC-bonded organic radicals selected from the group consisting of radicals containing carbon and hydrogen atoms, radicals containing carbon, hydrogen and at least 2 oxygen atoms per radical and radicals containing carbon, hydrogen and at least 2 oxygen atoms and at least one Si atom, in which the SiOC-bonded organic radicals have at least 6 carbon atoms per radical and (d) up to 10 percent by weight of 2,2,4- trimethyl-1,3diisobutyryloxypentane, based on the weight of the essentially linear organopolysiloxane, the silicone resin and filler.

4,919,844

ENHANCED HEAT TRANSFER REFORMER AND METHOD

Shoou-I Wang, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Aug. 16, 1984, Ser. No. 641,819

Int. Cl.[5] C10B 3/36

U.S. Cl. 252—373 5 Claims

1. A method for reforming hydrocarbons in a plural stage reformation wherein a first reformation of a first reactant stream occurs in a first reforming zone heated by combustion furnace gases and a second reformation of a second reactant stream occurs in a second reforming zone which second reformation comprises the steps of:

(a) introducing said second reactant stream of hydrocarbons and steam at elevated temperature and pressure into said second reforming zone;

(b) passing said second reactant stream through a plurality of reaction tubes while contacting said second reactant stream with reforming catalyst packed in said tubes;

(c) introducing a reformed reaction product at elevated temperature and pressure into said second reforming zone but outside said tubes at a temperature substantially above the temperature of said second reactant stream at the latter's introduction into said second reforming zone;

(d) mixing the reformed reaction product with similar product produced from said second reactant stream passing through said reaction tubes;

(e) heating said second reactant stream to reaction temperature and reforming it in said reaction tubes by heat exchange of said mixed reaction product with said second reactant stream, and

(f) removing a mixed reaction product of reformed fluid from said second reforming zone.

4,919,845

PHOSPHATE-FREE DETERGENT HAVING A REDUCED TENDENCY TOWARDS INCRUSTATION

Guenther Vogt, Toenisvorst; Hans Andree, Leichlingen, and Gertrud Nienhaus, Duesseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 195,996, May 19, 1988, abandoned. This application Jul. 7, 1989, Ser. No. 378,447

Claims priority, application Fed. Rep. of Germany, May 21, 1987, 3717227

Int. Cl.[5] C11D 3/08, 3/12, 3/30, 3/36

U.S. Cl. 252—526 10 Claims

1. A detergent composition consisting of:

(a) from about 5 to about 35% by weight of at least one water-soluble surfactant selected from the group consisting of an anionic and a nonionic compound,

(b) from about 10 to about 40% by weight of a finely crystalline synthetic zeolite NaA,

(c) from about 4 to about 20% by weight of a washing alkali selected from the group consisting of an alkali metal silicate and carbonate,

(d) the following compounds in the form of their alkali metal salt; based on free acid,

(d1) from about 0.1 to about 1% by weight of an aminoalkane polyphosphonic acid,

(d2) from about 0.5 to about 5% by weight of a linear polymer or copolymer of acrylic acid or methacrylic acid and maleic acid, and

(e) from about 0.5 to about 1% by weight, based on free acid, of 1-hydroxyethane-1,1-diphosphonate in the form of its alkali metal salt, with the proviso that the ratio by weight of component (d1):(e) is from about 40:1 to about 2:1, all weights being based on the weight of said detergent composition.

4,919,846

DETERGENT COMPOSITION CONTAINING A QUATERNARY AMMONIUM CATIONIC SURFACTANT AND A CARBOXYLATE ANIONIC SURFACTANT

Yasunari Nakama; Fuminori Harusawa; Kyoko Otsubo; Tsunehiko Iwai; Shuya Tamaki, and Masahiro Ohkoshi, all of Yokohama, Japan, assignors to Shiseido Company Ltd., Tokyo, Japan

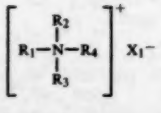
Continuation-in-part of Ser. No. 54,342, May 26, 1987, abandoned. This application Sep. 23, 1988, Ser. No. 249,047

Claims priority, application Japan, May 27, 1986, 61-121962; Sep. 24, 1987, 62-239717; Nov. 19, 1987, 62-292933; Nov. 30, 1987, 62-302791; Nov. 30, 1987, 62-302792

Int. Cl.[5] C11D 1/10, 1/65

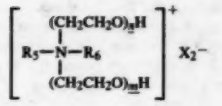
U.S. Cl. 252—542 24 Claims

1. A detergent composition comprising, in an aqueous medium, (i) at least one quaternary ammonium cationic surfactant selected from the group consisting of (a) monoalkyl quaternary ammonium salt cationic surfactants having the formula (I):



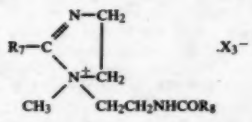
(I)

wherein R_1 represents an alkyl or alkenyl having 12 to 22 carbon atoms, R_2, R_3, and R_4 independently represent methyl or ethyl, and X_1 represents a halogen atom or a methylsulfate residue, (b) ethylene oxide addition quaternary ammonium salt cationic surfactants having the formula (II):



(II)

wherein R_5 represents an alkyl having 16 to 22 carbon atoms, R_6 represents methyl, ethyl, or an alkyl having 16 to 22 carbon atoms, X_2 represents a halogen atom or a methylsulfate or ethylsulfate residue, m and n are independently an integer of at least 1, provided that the sum of m and n is 2 to 30, and (c) imidazoline quaternary ammonium salt cationic surfactants having the formula (III):

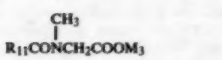


(III)

wherein R_7 and R_8 independently represent an alkyl or alkenyl having 12 to 22 carbon atoms, and X_3 represents a halogen atom or a methylsulfate or ethylsulfate residue;

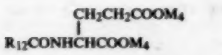
(ii) at least one carboxylate anionic surfactant selected from the group consisting of:

N-acylsarcosinate anionic surfactants having the formula:



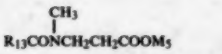
wherein R_{11} represents an alkyl or alkenyl group having 8 to 18 carbon atoms and M_3 represents one or more of alkali metals, organic amines, and basic amino acids;

N-acylglutamates having the formula:



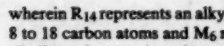
wherein R_{12} represents an alkyl or alkenyl group having 8 to 18 carbon atoms and M_4 independently represents one or more of alkali metals, organic amines, and basic amino acids;

N-acyl-N-methyl-β-alanine salt anionic surfactants having the formula:



wherein R_{13} represents an alkyl or alkenyl group having 8 to 18 carbon atoms and M_5 represents one or more of alkali metals, organic amines, and basic amino acids; and

N-acyl alanine salt anionic surfactant having the formula:



wherein R_{14} represents an alkyl or alkenyl group having 8 to 18 carbon atoms and M_6 represents one or more of alkali metals, organic amines, and basic amino acids; and

(iii) at least one amphoteric surfactant, the mole ratio of the components (i)/(ii) being within the range of from 4/6 to 8/2.

4,919,847

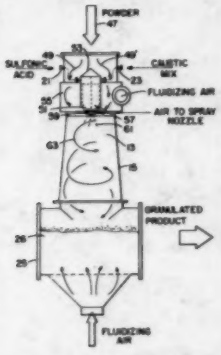
PROCESS FOR MANUFACTURING PARTICULATE DETERGENT COMPOSITION DIRECTLY FROM IN SITU PRODUCED ANIONIC DETERGENT SALT

Gualtiero Barletta, and Antonio Bianchi, both of Rome, Italy, assignors to Colgate Palmolive Co., Piscataway, N.J.

Filed Jun. 3, 1988, Ser. No. 202,773

Int. Cl.[5] C11D *1/22, 11/04, 13/10*

U.S. Cl. 252—558 **11 Claims**



1. A process for manufacturing a particulate detergent composition which comprises reacting an anionic synthetic organic detergent acid with a neutralizing agent for it in a reaction vessel in sufficient proportion to produce a corresponding neutralized detergent salt in liquid or slurry state, removing the neutralized detergent salt from the reaction vessel in such state and directly transferring it to a walled absorption zone interiorly of a particular carrier for it, so that the carrier helps to prevent contact of the detergent salt liquid or slurry with the surrounding absorption zone walls, and mixing the resulting particulate carrier containing absorbed detergent salt liquid or slurry, to produce a detergent salt-carrier composition in particulate form.

4,919,848

PROCESS FOR THE QUENCHING OF FLUORESCENCE, AND NEW CATIONIC NAPHTHALENE-PERI-DICARBOXYLIC ACID IMIDE DERIVATIVES

Horst Harnisch, Much, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 30, 1986, Ser. No. 913,888

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1985, 3535496

Int. Cl.[5] G03C *1/00*; D06L *3/00*

U.S. Cl. 252—600 **5 Claims**

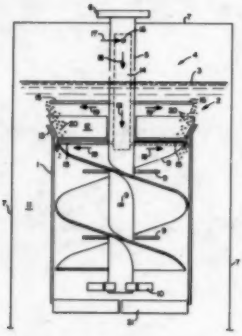
1. A process for the quenching of the fluorescence created by anionic optical brighteners said process comprising adding a substrate containing said optical brighteners virtually colorless, water-soluble, cationic compounds, wherein said compounds contain at least one cationic group per molecule and at least two naphthalene-peri-dicarboxylic acid imide groups which are nitro group free per molecule.

4,919,849

GAS-LIQUID MIXING PROCESS AND APPARATUS

Lawrence M. Litz, Pleasantville, and John J. Santalone, Jr., White Plains, both of N.Y., assignors to Union Carbide Industrial Gases Technology Corporation, Danbury, Conn.

Filed Dec. 23, 1988, Ser. No. 289,265
Int. Cl.[5] B01F *3/04*
U.S. Cl. 261—36.1 **20 Claims**



1. A process for mixing a gas and a liquid subject to change in liquid levels during the mixing operation in a mixing vessel having a hollow draft tube with an axial flow, down-pumping impeller means positioned thereon for vortex development and the ingestion of gas from an overhead gas space within the mixing vessel into the body of liquid therein, comprising:

(a) rotating said impeller means to create a recirculation flow pattern within the mixing vessel, with liquid passing downward inside the draft tube and upward in the annular space between said draft tube and the walls of the mixing vessel, so as to develop a vortex and to draw gas from the overhead gas space by gas ingestion at an operating liquid level within the mixing vessel;

(b) continuing to rotate said impeller means to create a recirculation flow pattern within the mixing vessel as the liquid level increases during the gas-liquid mixing operation such that vortex formation and gas ingestion become less favorable than occurs at said particular operating liquid level; and

(c) establishing fluid communication between said overhead gas space and gas ingestion tube means connected to the shaft of said impeller means that extend upward from said hollow draft tube through said overhead gas space, said gas ingestion tube means extending outward into the surrounding liquid, said gas ingestion tube means including a plurality of tubes positioned below the maximum liquid level and at least some of said tubes being positioned above said draft tube within the mixing vessel and having openings at the ends of said tubes facing outwardly away from said shaft, and being positioned such that the pressure reduction in the body of liquid adjacent the openings at the ends of the gas ingestion tube means upon continued rotation of said impeller means exceeds the hydrostatic head of liquid pertaining in the draft tube upon operation at liquid levels above said operating level for gas ingestion by vortex development, so that liquid present in the gas ingestion tube means and in the means for establishing fluid communication with the overhead gas space at the start of the gas-liquid mixing operation are drawn out through the gas ingestion tube means into the body of liquid, with gas from the overhead gas space likewise being drawn into the body of liquid through said fluid communication means and said gas ingestion tube means as said liquid level increases during continuation of said gas-liquid mixing operation, whereby the gas-liquid mixing operation can be effectively combined over a range of liquid levels within the mixing vessel.

9. An apparatus for mixing a gas and a liquid subject to change in liquid levels during the mixing operation comprising:

(a) a mixing vessel having a hollow draft tube with an axial flow, down-pumping impeller means positioned thereon and capable of creating a recirculation flow pattern within the mixing vessel, with liquid being passed downward inside the draft tube and upward in the annular space between the draft tube and the walls of the mixing vessel, thereby developing a vortex and drawing gas from the overhead gas space within the mixing vessel at an operating liquid level within said mixing vessel;

(b) gas ingestion tube means connected to the shaft of said impeller means, said impeller shaft extending upward from said hollow draft tube through said overhead gas space in the mixing vessel, said gas ingestion tube means extending outward into the surrounding liquid in the mixing vessel below the maximum liquid level to be employed in the mixing vessel, and said gas injection tube means including a plurality of tubes positioned below the maximum liquid level and at least some of said tubes being positioned above said draft tube within the mixing vessel and having openings at the ends of said tubes facing outwardly away from said shaft providing for fluid communication with the liquid in said mixing vessel when the liquid level is above the positioning of said gas ingestion tube means, said gas ingestion tube means being positioned such that pressure reduction in the body of liquid adjacent the openings at the ends of the gas ingestion tubes means upon rotation of said impeller means exceeds the hydrostatic head of liquid upon operation at liquid levels above said operating level for gas ingestion by vortex development; and

(c) fluid communication means between said overhead gas space and said gas ingestion tube means, said gas ingestion tube means thereby providing fluid communication between the overhead gas space and the body of liquid at the openings at the ends of said gas ingestion tube means, so that liquid present in the gas ingestion tube means and in the means for establishing fluid communication with the overhead gas space are drawn out through the gas ingestion tube means into the body of liquid, with gas from the overhead space likewise being drawn into the body of liquid through said fluid communication means and said gas ingestion tube means as said liquid level increases during continuation of the gas-liquid mixing operation, whereby the gas-liquid mixing operation can be effectively continued over a range of liquid levels within the mixing vessel.

4,919,850

METHOD FOR CURING PLASTIC LENSES

Ronald D. Blum, 5320 Silver Fox Rd., Roanoke, Va. 24014; Scott Reid, 24 Tanglewood Dr., Irvine, Calif. 92714, and Howard P. Silverman, 140 E. Duarte Rd., Monrovia, Calif. 91016

Filed May 6, 1988, Ser. No. 190,856
Int. Cl.[5] B29D *11/00*
U.S. Cl. 264—1.4 **24 Claims**

1. A method for molding and curing plastic lenses comprising the steps of:

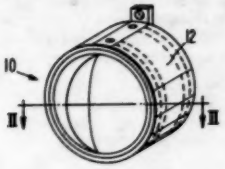
(a) arranging a first mold form and a second mold form in a spaced relationship to form a mold apparatus with a cavity therebetween for receiving lens molding material and for forming a lens of selected configuration, and sealing said first and second mold forms in said spaced relationship, said first and second mold form corresponding to surfaces of a prescription lens;

(b) injecting lens molding material comprising a liquid monomer, a thermal initiator, and a photosensitive initiator into said cavity between said mold forms;

(c) subsequent to said injecting step, heating throughout said

mold apparatus sufficiently to activate said thermal initiator to form said lens molding material into a gel;

(d) subsequent to said heating step, subjecting said mold apparatus to ultraviolet light for a period of time sufficient to completely cure said lens molding material within said



cavity from a gel into a hardened lens of optical quality; and

(e) subsequent to said step of subjecting said mold apparatus to ultraviolet light, removing said hardened lens from said mold apparatus.

4,919,851

PROCESS FOR PRODUCING AN OPTICAL COUPLER FOR POLYMER OPTICAL WAVEGUIDES

Jochen Coutandin, Bretzenheim; Jürgen Theis; Werner Grob, both of Frankfurt am Main, and Peter Herbrechtsmeier, Königstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 4, 1988, Ser. No. 267,030

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1987, 3737930

Int. Cl.[5] B29D *11/00*

U.S. Cl. 264—1.5 **6 Claims**

1. A process for producing an optical coupler for polymer optical waveguides comprising the steps of unidirectionally arranging and bundling two to 10^5 optical waveguides, placing the optical waveguides within a shrink sleeve of thermoplastic material, and heating the shrink sleeve and waveguides to a temperature above the shrink temperature of the sleeve and higher than the softening temperature of the polymer optical waveguides, such temperature being in the range of 50° to 330° C., to thereby shrink the sleeve, and press and fuse the waveguides together to form a rod.

4,919,852

LIGHTWEIGHT CERAMIC INSULATION AND METHOD

David J. Green, State College, Pa., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 30, 1988, Ser. No. 213,392

Int. Cl.[5] B29B *33/02*

U.S. Cl. 264—6 **6 Claims**

1. A method for making a ceramic comprising the steps of:

(a) dissolving at least one water soluble salt which after heating or chemical conversion can become a high temperature ceramic in water such that after dissolution the solution contains 75% to 99.5% water by volume;

(b) spraying the salt and water solution prepared in step (a) into a cryogenic liquid;

(c) evaporating the water of the solution under vacuum below the freezing point of the solution to produce a powder;

(d) forming the powder material; and

(e) sintering the formed material at greater than 800° C.

4,919,853

APPARATUS AND METHOD FOR SPRAYING LIQUID MATERIALS

Joseph L. Alvarez, Idaho Falls, and Lloyd D. Watson, Rigby, both of Id., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 21, 1988, Ser. No. 146,631

Int. Cl.[5] B29B *9/10*

U.S. Cl. 264—12 **6 Claims**

1. An apparatus for spraying liquids comprising:

a nozzle of certain dimensions having a converging gas inlet portion;

a choke portion;

a divergent spray outlet poriton, said choke portion being intermediate and connecting said converging gas inlet portion with said divergent spray outlet portion, said nozzle being formed by an iterative procedure in successive steps to change the nozzle dimensions and thereby form a desired spray pattern and particle size beginning with the equation

$$\frac{A}{A^*} = \frac{1}{M}\left[\frac{2}{\gamma+1} + \frac{\gamma-1}{\gamma+1}M^2\right]^{(\gamma+1)/(2(\gamma-1))}$$

wherein the area A is the area of the nozzle measured at a selected distance downstream the area A* is the area of the nozzle throat, M is the ratio of the speed of the gas flow to speed of sound, and γ is a function of the specific heats of the two-phase gas mixture; and

a liquid inlet means, said liquid inlet means terminating in the region of said choke portion to permit the feeding of a liquid into the region of the choke point for mixing with a gas from said gas inlet to form a two-phase mixture.

4,919,854

METHOD FOR PRODUCING SUPERFINE POWDER IN SPHERICAL FORM

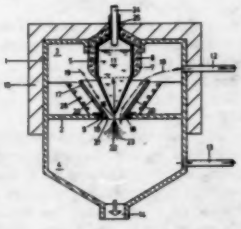
Alfred Walz, Emmendingen, Fed. Rep. of Germany, assignor to Dr.-Ing. Lader Gerking, Berlin, Fed. Rep. of Germany

Continuation of Ser. No. 25,649, Mar. 13, 1987, abandoned, which is a division of Ser. No. 906,018, Sep. 11, 1986, abandoned. This application Oct. 11, 1988, Ser. No. 257,957

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1985, 3533954

Int. Cl.[5] B22F *9/08*

U.S. Cl. 264—12 **7 Claims**



1. A method for producing superfine powder in spherical form with a diameter up to about 30 μm from metal, metal alloy or ceramic melts in a rotationally symmetrical Laval nozzle system having a gas feeder funnel with a narrow neck forming a Laval nozzle through which a laminar flow of a propellent gas passes, emitting the melt as a molten stream from an aperture in a reservoir within the Laval nozzle system and passing said molten stream through said narrow neck superheating said molten stream before said stream emerges

from said neck and prior to stream separation into molten threads, said superheating being effected by the heating of said gas feeder funnel which focuses radiant heat on the axis of rotation of said funnel, said molten stream emerging from said Laval nozzle as molten threads which break down into powder, and said break down being regulated by said radiant heating.

4,919,855

PROCESS FOR PRODUCING A BLOW-MOLDED CONTAINER

Alfred Thomas, Hennef-Dambroich, Fed. Rep. of Germany, assignor to Kautex Werke Reinold Hagen AG, Fed. Rep. of Germany

Filed Apr. 21, 1988, Ser. No. 184,515

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1987, 3729571; Oct. 26, 1987, 3736164

Int. Cl.[5] B29C *49/04, 49/78, 49/80*

U.S. Cl. 264—21 **26 Claims**

1. In a process for producing a hollow, blow-molded container having at least one wall portion which is a co-extruded, multilayer laminate of at least predominantly thermoplastic materials and in which at least one layer of said multilayer laminate must have integrity throughout said one layer, comprising first plasticizing the materials for forming the respective layers of the laminate in at least first and second extruders, passing the materials into a common extrusion head in which they are combined and from which the laminate is extruded, and blow molding the laminate to form said hollow container, the improvement comprising adding to the material from which said at least one layer is formed a substance which makes it possible for the integrity of said at least one layer in said container to be detected by at least one detection means which interacts with said substance.

4,919,856

PROCESS FOR PRODUCING MEMBRANES FOR USE IN GAS SEPARATION

Takanori Anazawa, Sakura; Kazuo Hasumi, Odawara, and Yoshiyuki Ono, Sakura, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Filed Feb. 23, 1988, Ser. No. 159,301

Int. Cl.[5] B29C *67/20*

U.S. Cl. 264—22 **87 Claims**

1. A method for producing a gas separation membrane comprising a microporous support having provided thereon a non-porous coating layer, comprising:

(1) melt-extruding a thermoplastic crystalline polymer under the conditions of a melt-extrusion temperature, T_{EX}, which is between Tm°C. and (Tm+100)°C. where Tm designates the crystalline melting point of the polymer and a draft ratio, Df, satisfying the relationship:

$$5 \leq Df \leq 10{,}000$$

to form a precursor in the form of a hollow fiber or flat film;

(2) coating said precursor as a support with a coating substance composed of a natural or synthetic substance capable of forming a polymeric layer which layer does not form pinholes upon subsequent drawing process after solidification to form a coating layer on the surface of said support;

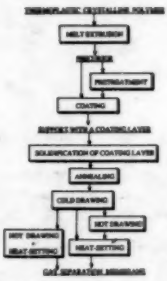
(3) solidifying said coating layer;

(4) annealing said support at an annealing temperature, T_{AN}, which is between (Tg+20)°C. and (Tm−5)°C. where Tg indicates the glass transition temperature of said support and Tm has the same meaning as defined above;

(a) after said coating process (2) above, or

(b) prior to said coating process (2) above;

(5) cold drawing the thus-treated support with said coating layer at cold drawing temperature, T_{CD}, which is between (Tg−50)°C. and (Tm−10)°C. where Tg and Tm have the same meanings as defined above; and



(6) heat-setting said support with said coating layer at a heat-setting temperature, T_{HS}, which is between (the drawing temperature used in the step (5) above+10)°C. and Tm°C. where Tm has the same meaning as defined above to form micropores only in said support;

thus forming a composite membrane comprising a microporous support having laminated thereon a non-porous coating layer.

4,919,857

METHOD OF MOLDING A PIN HOLDER ON A LEAD FRAME

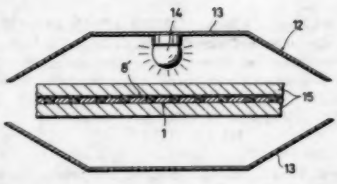
Tetsuya Hojyo, No. 33-6, 3-cho, Wakamatsudai, Sakai-shi, Osaka, Japan

Division of Ser. No. 102,585, Sep. 29, 1987, abandoned. This application Aug. 25, 1988, Ser. No. 237,406

Claims priority, application Japan, Mar. 11, 1987, 62-55808

Int. Cl.[5] B29C *35/08, 39/10*

U.S. Cl. 264—22 **9 Claims**



1. A pin holding method for a lead frame having a plurality of inner lead pins associated with an island, the method comprising:

applying a fluid resin material directly through a dispenser across successive ones of said inner lead pins so that said resin material flows into a gap between each adjacent two of said successive inner lead pins, said resin material being high in heat resistance as well as in purity, electrically non-conductive, and low in linear expansibility;

causing said resin material to harden; and

wherein said lead frame together with said resin material is interposed under pressure between a pair of flat presser plates while said resin material is hardened.

4,919,858

PROCESS FOR THE PRODUCTION OF A BONDED MAGNET

Thomas H. Newton, Cheshire, England, and Tatsuya Shimoda, Nagano, both of Japan, assignors to Imperial Chemical Industries PLC, London, England and Seiko Epson Corporation, Tokyo, Japan

Filed Nov. 28, 1988, Ser. No. 276,842

Claims priority, application United Kingdom, Nov. 27, 1987, 8727851

Int. Cl.[5] B29C *41/04, 71/00*

U.S. Cl. 264—24 **29 Claims**

1. A process for the production of a shaped article having magnetic properties from a shaped composition which comprises a mixture of a cross-linkable organic material and a particulate magnetic material, which process comprises

(1) placing the shaped composition in a mold,

(2) rotating the mold about an axis thereof,

(3) cross-linking the organic material in the shaped composition while rotating the mold, and

(4) recovering from the mold a shaped article which comprises a mixture of a cross-linked organic material and a particulate magnetic material.

4,919,859

PROCESS OF MAKING AN ACOUSTIC CARBON DIAPHRAGM

Yoshihisa Suda, Maebashi, Japan, assignor to Mitsubishi Pencil Co., Ltd., Tokyo, Japan

Filed Sep. 1, 1988, Ser. No. 239,266

Int. Cl.[5] C01B *31/02*

U.S. Cl. 264—29.5 **13 Claims**

1. A process for producing an acoustic diaphragm of carbonaceous material comprising the steps of:

impregnating a member selected from the group consisting of nonwoven fabric of carbon fiber having high elasticity and woven fabric of carbon fiber having high elasticity with thermosetting resin to form an impregnated carbon fiber fabric;

thermally molding said impregnated carbon fiber fabric into a diaphragm shape to form a molding,

calcining said molding in an inert gas atmosphere to obtain a porous carbon molding made of carbonized fiber and carbonized thermosetting resin,

heating said porous carbon molding to a uniform temperature, and

depositing vapor phase carbon upon a surface of said porous carbon molding, said carbon being generated by thermal decomposition of a hydrocarbon-containing material introduced together with a carrier gas, to produce an acoustic diaphragm having a surface comprising a dense layer of carbonized fiber-carbonized thermosetting resin carbon-thermally decomposed carbon, and an interior comprising a porous material of carbonized fiber bonded to the carbonized thermosetting resin carbon and the thermally decomposed carbon.

4,919,860

MANUFACTURE OF POROUS CARBON MEMBRANES

Erich Schindler, and Franz Maier, both of Obernburg, Fed. Rep. of Germany, assignors to Akzo NV, Arnhem, Netherlands

Filed Jul. 13, 1988, Ser. No. 218,280

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1986, 3621257

Int. Cl.[5] B29C *67/20, 71/02*

U.S. Cl. 264—29.1 **11 Claims**

1. A process for making porous carbon membranes having a porosity of from 10 to 90% and having maximum pore diameter of from 0.005 to 3 microns in the form of capillary, tubular, or flat membranes and comprising more than 75 weight percent of carbon, comprising:

pretreating a porous membrane from an acrylonitrile polymer in an aqueous hydrazine solution containing at least 40 weight percent of hydrazine,

washing and drying said membrane,

heat treating said membrane in a temperature range of 180° to 350° C., and

carbonizing said membrane in a temperature range of 600° to 3000° C., whereby clogging of the pores in said membrane is prevented.

4,919,861

METHOD FOR CONDITIONING GOLF CLUB GRIP

Delvin D. Schutes, 1919 S. Los Altos, Mesa, Ariz. 85202

Filed May 30, 1989, Ser. No. 357,803

Int. Cl.[5] B32B *1/00, 35/00*

U.S. Cl. 264—36 **8 Claims**

1. A method for conditioning and increasing the tackiness of a used grip on the upper end of a handle of a golf club so a golfer can more readily grasp and control the grip during a golf stroke, said grip having an outer surface and a longitudinal axis and being substantially comprised of an elastic rubber material, said method including the steps of

(a) contacting said outer surface with at least one ruffling edge portion of each of a plurality of spaced apart teeth attached to and outwardly projecting from a backing, said ruffling edge portion on any one of said teeth being spaced apart from ruffling edge portions on the remaining ones of said teeth, said backing having an axis; and,

(b) drawing said ruffling edge portions over said grip to frictionally engage and resiliently compress and ruffle said surface to produce raised protuberances on said surface and increase the tackiness of said grip.

4,919,862

PROCESS AND APPARATUS FOR MARKING ARTICLES OF FOAM MATERIAL WHEN PRODUCED IRREGULARLY

Pier E. Gilardi, Robbio, Italy, assignor to Gestioni Riunite Toscana Gomma S.p.A., Robbio, Italy

Filed Jan. 31, 1989, Ser. No. 304,192

Claims priority, application Italy, Feb. 10, 1988, 67096 A/88

Int. Cl.[5] B29C *67/22*

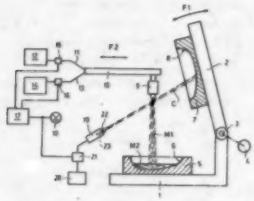
U.S. Cl. 264—40.1 **10 Claims**

1. In a process for the production of a molded article of foam material which process includes the steps of mixing reactive components in a metering head to prepare a reactive mixture, delivering said reaction mixture from said metering head to a cavity of a lower shell of an open mold, closing said mold by lowering an upper shell thereon, and forming said molded article within said closed mold, the improvement comprising

monitoring operational parameters of said process to determine the existence of irregularities in said parameters which may result in the production of a defective molded article, and

upon determining the existence of an irregularity in said parameters, subsequent to introduction of said reactive

material into said lower shell portion of said mold and while said mold is still open, applying a mark to an inside surface of said upper shell portion, which mark is transferable to said molded article upon being formed in said mold



to identify said article as being produced as a result of irregular operational parameters, and transferring said mark onto said molded article upon being formed in said mold.

4,919,863

FILTER FOR SMALL PARTICLES

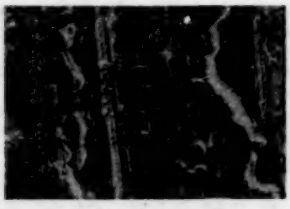
Friedrich Behr, Krefeld, Fed. Rep. of Germany, assignor to Thyssen Edelstahlwerke AG, Krefeld, Fed. Rep. of Germany

Division of Ser. No. 229,524, Aug. 8, 1988, Pat. No. 4,859,338. This application Mar. 3, 1989, Ser. No. 317,837

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1987, 3726076

Int. Cl.[5] B01D *13/04*

U.S. Cl. 264—42 **11 Claims**



1. A method comprising manufacturing a material for use in a filter body for filtering solid particles with diameters generally smaller than 5 μm from flowing fluids, said body having pores and columnar and/or platelet-shaped oxides at least in and around the pores, said filter body comprising at least one steel foil (2) which is provided with an oxidic covering layer (3) containing columnar and/or platelet-shaped oxides (4,6) said by forming an oxidic covering layer containing columnar and/or platelet-shaped oxides at least in and around the pores of a porous steel foil.

4,919,864

METHOD FOR MAKING MULTICOLORED FOAM

Dennis A. Knaus, West Barnstaple, Mass., assignor to Packaging Industries Group, Inc., Hyannis, Mass.

Filed Feb. 26, 1988, Ser. No. 162,792

Int. Cl.[5] B29C *47/04*

U.S. Cl. 264—45.9 **4 Claims**

1. A process for making a foam product comprising selected portions possessing different properties, said process comprising:

passing a first foamable thermoplastic material into a first means for extruding plastic material;

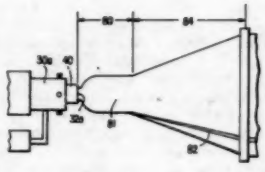
passing a second foamable thermoplastic material into a second means for extruding plastic material;

passing said first material into a passage for conveying material to an exit orifice;

passing said second material into said passage from at least one position at the perimeter of the passage closely adjacent said exit orifice, said second material passing onto a selected portion of a surface of said first material flowing longitudinally through the exit orifice, concurrently with said first material;

continuously extruding said two materials in tubular form through the exit orifice concurrently without substantial mixing;

foaming the two materials to form a tube comprising a first foamed material and a second foamed material, said second foamed material covering only said selected portion of the surface of the first foamed material, leaving substantial portions of the surface of the first foamed material uncovered; and



slitting the tube to provide a sheet of foamed material thereby forming a predetermined pattern of second foamed material on the surface of the sheet of first foamed material;

whereby the resulting sheet of foamed material includes defined portions of said first and second foamed materials in a predetermined pattern in which the second foamed material extends transversely over only said selected portion of the surface of the first foamed material in said predetermined pattern in the same longitudinal direction of flow as the first foamed material leaving substantial portions of the surface of said first foamed material uncovered.

4,919,865

COMPOSITE MEMBRANES OF POLY (METHYL METHACRYLATE) BLENDS, THEIR MANUFACTURE AND THEIR USE

Joyce K. Nelson, Lexington, Mass., assignor to Union Carbide Industrial Gases Technology Corporation, Danbury, Conn.

Filed Nov. 5, 1987, Ser. No. 117,639

Int. Cl.[5] E01D *13/00, 13/04*

U.S. Cl. 264—45.1 **60 Claims**

1. A composite membrane capable of selectively permeating at least one more readily permeable gaseous component from a gaseous feed mixture containing said component, and utilizing the high selectivity characteristics of poly(methyl) methacrylate) without the corresponding low permeability characteristics thereof, comprising:

(a) a porous support layer that serves to provide support for a thin separation layer positioned thereon, said porous substrate having substantially no gas separation characteristics with respect to said gaseous feed mixture; and

(b) an essentially non-porous gas separation layer positioned on said porous support layer, said separation layer that substantially determines the separation characteristics of the composite gas membrane being comprised of a mixture of poly(methyl methacrylate) or a copolymer thereof containing at least 50% by weight of poly(methyl methacrylate) and at least one cellulosic derivative, the proportions of said materials being selected so as to match the high separation characteristics provided by said poly(-methyl methacrylate) and the high permeation character-

istics provided by said cellulosic derivative to provide a particular, uniquely complementing combination of high gas separation and permeability for the separation of a particular gaseous feed mixture, whereby said composite membrane exhibits an enhanced combination of gas separation and permeability characteristics.

4,919,866

MANUFACTURE OF LIGHTWEIGHT STRUCTURAL ELEMENTS

Albert F. Kubbutat, Wihislingen, Fed. Rep. of Germany, assignor to Sto Aktiengesellschaft, Stuhlingen, Fed. Rep. of Germany

Filed May 5, 1988, Ser. No. 190,650

Claims priority, application Fed. Rep. of Germany, May 9, 1987, 3715487

Int. Cl.[5] B29C *67/20, 67/24*

U.S. Cl. 264—45.3 **10 Claims**

1. A method for manufacturing lightweight structural elements using blown glass spheres and a foamed organic binder, in which the blown glass spheres are mixed with the binder, which foams up and hardens and thus forms a matrix, comprising the steps of mixing

(a) 70–95 parts by weight open porous blown glass spheres having a grain fraction of 0.2 to 20 mm and a gross density between 0.2 and 0.55 g/c^3,

(b) 4–30 parts by weight of a liquid epoxy binder consisting of bisphenolic resin and an amine hardener, and

(c) 0.5–5 parts by weight of a liquid polysiloxane

to wet the surface of the blown glass spheres,

pouring the mixture into a mold corresponding to the shape of the lightweight structural element, and

adding heat,

whereby a reaction of the amine hardener with the polysiloxane and with the epoxy resin occurs to form a foam structure of the binder in voids between and surrounding the blown glass spheres.

4,919,867

METHOD FOR SINTERING HIGH TEMPERATURE CERAMICS

Wilhelm Königs, and Milan Hrovat, both of Rodenbach, Fed. Rep. of Germany, assignors to NUKEM GmbH and ALKEM GmbH, Hanau, Fed. Rep. of Germany

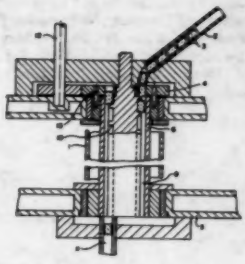
Filed Nov. 9, 1987, Ser. No. 118,035

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1986, 3641253

Int. Cl.[5] C04B *35/64*

U.S. Cl. 264—57 **1 Claim**

1. A method for the continuous sintering of ceramic shaped articles in a furnace which comprises guiding the shaped articles vertically through a furnace along a helical rib of a stationary, vertically positioned helix by rotating a tube around and adjacent to the helix, the tube being provided with vertically-extending longitudinal ribs and providing heat to the furnace, the sintering time being regulated by the rotation speed of the



tube and/or by selecting a replaceable helix to provide the desired sintering time.

4,919,868

PRODUCTION AND SINTERING OF REACTION BONDED SILICON NITRIDE COMPOSITES CONTAINING SILICON CARBIDE WHISKERS OR SILICON NITRIDE POWDERS

Jow-Lay Huang, Troy, Mich., assignor to Champion Spark Plug Company, Toledo, Ohio

Filed Mar. 31, 1988, Ser. No. 175,905

Int. Cl.[5] C04B *35/58*

U.S. Cl. 264—65 **2 Claims**

1. A method for producing a sintered reaction bonded silicon nitride composite which contains silicon nitride, is reinforced with silicon carbide whiskers, or both, which method comprises mixing powdered silicon having an average particle size not greater than 5 μm with a suitable amount of a sintering aid and

(a) from 10 to 35 percent of silicon carbide whiskers,

(b) from 15 to 50 percent of silicon nitride, or

(c) from 10 to 35 percent of silicon carbide whiskers and from 15 to 50 percent of silicon nitride,

pressing a shape from the resulting mixture, heating the shape in a nitrogen atmosphere at a pressure of about 1 atmosphere absolute, and controlling the heating rate:

(d) until a predetermined temperature is reached, so that reaction between nitrogen and the shape is substantially complete at any given temperature before the shape is heated above that temperature, the predetermined temperature being one at which it has previously been determined that the consumption of nitrogen by reaction between silicon of the shape and nitrogen is complete when the heating is conducted so that reaction between nitrogen and the shape is substantially complete at any given temperature before the shape is heated above that temperature, and

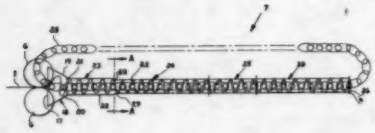
(e) thereafter heating the shape rapidly from said predetermined temperature to a temperature sufficiently high to produce, by reaction involving the sintering aid, a sufficient amount of a glass to produce a Si_3N_4 body having from 65 to 85 percent of theoretical density,

wherein the suitable amount of a sintering aid is from 3 to 7 percent each of MgO and CeO_2, 2 to 8 percent of Y_2O_3, 6 percent of Y_2O_3 and 2 percent of Al_2O_3, 2 to 8 percent of MgO, BeO, HfO_2 or ZrO_2, or 1 to 5 percent of CaO.

4,919,869
APPARATUS FOR AND PROCESS OF TREATING SHRINKABLE FIBERS

Tony D. Zatkulak, Midlothian; David J. Rodini, Richmond, and James D. Hodge, Midlothian, all of Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 55,394, May 29, 1987, abandoned. This application Mar. 22, 1989, Ser. No. 326,443
Int. Cl.[5] D01F 6/60; D06P 3/24; D06B 3/04
U.S. Cl. 264—78 19 Claims



1. A process of treating a tow of shrinkable fibers including the steps of:

moving the tow in folds through a plug section operatively connected by a restricted opening to a treatment section, said plug section having an entrance opening larger than the restricted opening of the treatment section, and

heating the tow with steam in the treatment section

wherein sufficient steam migrates through the restricted opening from the treatment section to the plug section to cause shrinkage of the tow in the plug section, and

wherein the tow has a cross-sectional area substantially the same as the cross-sectional area of the entrance opening of the plug section as it moves through said opening and

wherein the tow has a smaller cross-sectional area as it leaves the plug section and moves through the entrance opening of the treatment section, due to shrinkage, and

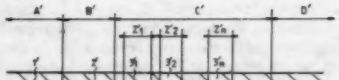
wherein the cross-sectional area of the shrunken tow as it enters the smaller entrance opening of the treatment section is substantially the same as the cross-sectional area of this opening and

wherein the tow moving in folds in the plug section substantially prevents the loss of steam through the entrance opening of the plug section.

4,919,870
PROCESS OF AND APPARATUS FOR TREATING A SHAPED PRODUCT

Jean-Pierre Ihar, Avenue de la Division-Leclerc, F-91100 Ballainvilliers, France

PCT No. PCT/FR87/00501, § 371 Date Oct. 15, 1988, § 102(e) Date Oct. 15, 1988, PCT Pub. No. WO88/04606, PCT Pub. Date Jun. 30, 1988
PCT Filed Dec. 15, 1987, Ser. No. 246,396
Claims priority, application France, Dec. 15, 1986, 86 17472
Int. Cl.[5] B29C 71/00
U.S. Cl. 264—70 15 Claims



1. A method of rheological treatment of a cylindrical product, comprising the steps of:

moving the cylindrical product longitudinally through a sequence of zones;

in each zone, applying to the cylindrical product a combination of a preselected temperature, pressure against at least one surface of the cylindrical product, and vibrational frequency; and

applying the combinations of the temperature, the pressure, and the vibrational frequency applied to the cylindrical product in each of the sequence of zones according to a predetermined program.

2. Apparatus for rheological treatment of a cylindrical product, comprising:

a plurality of independently controllable stages, each stage adapted for accepting the cylindrical product to pass therethrough;

in each stage, means for applying to the cylindrical product a preselected temperature, pressure, and vibrational frequency; and

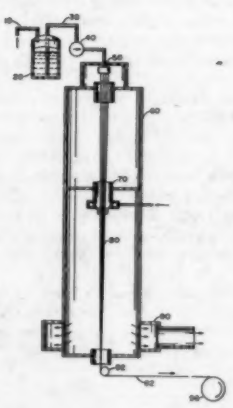
means for moving the cylindrical product longitudinally through the stages in series,

wherein the preselected conditions of the temperature, the pressure, and the vibrational frequency in each of the plurality of zones correspond to a predetermined program.

4,919,871
FORMING GLASS FIBERS FROM SOL-GEL COMPOSITIONS

Chia-Cheng Lin, Hampton Township, Allegheny County, and Roger C. Milliron, Jr., Lower Burrell, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 4, 1989, Ser. No. 293,403
Int. Cl.[5] D01F 9/08
U.S. Cl. 264—82 10 Claims



1. A method for producing solid inorganic oxide fibers from a liquid metal alkoxide sol-gel composition comprising the steps of:

a. forming a liquid sol of an alkoxide compound having the general formula $M(OR)_x$ wherein M is an element which forms hydrolyzable alkoxides, R is an organic radical which forms hydrolyzable alkoxides and x is the valence of M;

b. hydrolyzing said alkoxide compound to a sufficient degree to provide a liquid sol of sufficient concentration and viscosity for fiber-forming;

c. passing said sol through an orifice to form a fiber; and

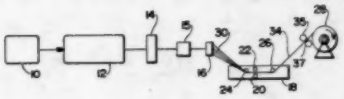
d. passing said fiber through a gaseous atmosphere to dry, wherein said gaseous atmosphere comprises ammonia in sufficient concentration such that the fiber may be wound without self-sticking.

4,919,872

PROCESS FOR METERING COLOR CONCENTRATES TO THERMOPLASTIC POLYMER MELTS

William A. Fintel, Lewes, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 186,010, Apr. 25, 1988, Pat. No. 4,848,915.
This application Feb. 16, 1989, Ser. No. 311,515
Int. Cl.[5] B29C 47/92
U.S. Cl. 264—103 1 Claim



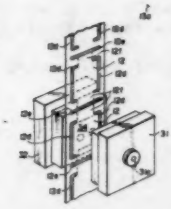
1. In a process for forming a color concentrate including the steps of compounding a pigment with a thermoplastic polymer melting said compounded material and extruding said melted compounded material as a continuous strand, the improvement comprising: winding said continuous strand in a constant weight-per-unit-length ratio onto a spool after extrusion.

4,919,873

METHOD OF MOLDING MAGNETIC TAPE CASSETTE BODY HALF

Kengo Oishi, and Osamu Suzuki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 76,636, Jul. 23, 1987, Pat. No. 4,825,320.
This application Mar. 25, 1988, Ser. No. 172,833
Claims priority, application Japan, Jul. 23, 1986, 61-112889
Int. Cl.[5] B29C 45/14
U.S. Cl. 264—130 6 Claims



1. A method of manufacturing half of a cassette body, two of which are used to house a pair of reels and a magnetic tape wound around the reels comprising the steps of: positioning between open mold halves a protective film strip consisting of a series of protective film units connected to each other near the edge of the protective film strip by connecting portions, each protective film unit defined by a pair of elongated openings on opposite sides of the film strip; closing the mold halves while one of the protective film units is positioned in the cavity defined by the thus closed mold halves with the connecting portions adjacent to the protective film unit sandwiched between the mold halves; injecting molding material into the cavity such that said protective film unit will become adhered to an outer surface of said cassette body half; and wherein upon closing of the mold halves the protective film strip is cut at opposite sides of the said connecting portions of the said protective film strip to sever the one protective film unit from the said protective film strip.

4,919,874

PROCESS FOR PREPARING A NYLON FIBER WITH REDUCED SPHERULITES

William T. Windley, Seaford, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 860,251, May 6, 1986, Pat. No. 4,729,923.
This application Sep. 11, 1987, Ser. No. 95,234
Int. Cl.[5] D01F 1/00, 6/60
U.S. Cl. 264—168 7 Claims

1. A process for preparing a nylon 66/6 copolymer fiber with reduced spherulites from a nylon 66/6 salt solution comprising the steps of:

(a) adding 1–6% caprolactam and 0.001–2% water-soluble inorganic calcium salt to 94–99% nylon 66 salt to form a nylon 66/6 salt solution;

(b) polymerizing the salt solution to form a polymer; and

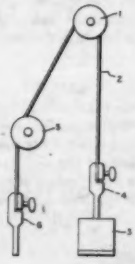
(c) extruding the polymer into filaments.

4,919,875

ORIENTED POLYMERIC TAPE PREPARATION

Teh-Chuan Wang, Parkersburg, W. Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 165,229, May 9, 1988, which is a continuation-in-part of Ser. No. 823,656, Jan. 29, 1986, abandoned. This application Apr. 6, 1989, Ser. No. 334,240
Int. Cl.[5] B29C 47/80
U.S. Cl. 264—171 6 Claims



1. A process for the preparation of polymeric tape which comprises melt blending about from 90 to 50 weight percent copolyetherester and, complement ally, about from 10 to 50 weight percent polyethylene terephthalate at a temperature which is about from 25 to 65 centigrade degrees above the higher crystalline melting point of the two polymeric components for a melt residence period of about from 70 to 225 seconds, extruding the polymer blend through a die orifice in the form of tape, and orienting the tape to provide an increase in the longitudinal dimension of about from 2.2 to 4.0 times the original extruded dimension of the tape, the blending temperatures and melt residence period being sufficient to change the appearance of the melt blend from opaque to translucent

4,919,876

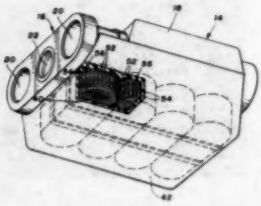
METHOD FOR MAKING COMPOSITE TREAD FOR TRACK-LAYING VEHICLES

Russell C. Savage; Gary P. Zeller, and Martin D. Skirha, all of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 141,965, Jan. 11, 1988, Pat. No. 4,880,283. This application Oct. 14, 1988, Ser. No. 257,590

Int. Cl.[5] B29C *45/14*

U.S. Cl. 264—258 **2 Claims**



1. A method for making a composite tread member having a metal support member embedded in an abrasion resistant fiber reinforced polymeric material by a reaction injection molding process in a matched upper and lower mold members having interior mold surfaces defining a mold cavity therein comprising the steps of:

positioning a multiplicity of an abrasion resistant fiber bundles in the lower mold member in an orientation such that said fiber bundles being in an about perpendicular relationship to said interior mold surface of said lower mold member,

said multiplicity of fiber bundles being arranged in elongated rolls formed by rolling narrow webbing of polyaramid fiber bundles interwoven with polyester fiber bundles with the polyaramid fiber bundles running in the transverse direction,

placing a metal support member on top of said fiber bundles,

closing said upper mold member onto said lower mold member forming a mold cavity therein,

injecting a quantity of a reaction injection moldable polymeric material into said mold cavity and thus embedding said fiber bundles and said metal support member, and

demolding said composite tread member after said polymeric material is cured in said mold cavity.

4,919,877

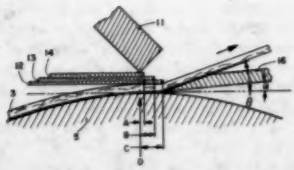
PROCESS FOR SOFTENING WEBS

Mark N. Parsons, and Rodney L. Abba, both of Neenah, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Continuation-in-part of Ser. No. 111,473, Dec. 3, 1987, abandoned, which is a continuation of Ser. No. 908,498, Sep. 17, 1986, abandoned. This application Sep. 8, 1989, Ser. No. 404,916

Int. Cl.[5] B31F *1/14*

U.S. Cl. 264—282 **15 Claims**



1. In a continuous process for softening a web wherein the web is supported on the surface of a rotating drum and lengthwise compressed in a treatment cavity defined by the surfaces of the rotating drum, a rigid primary blade which presses the web against the rotating drum, and an inclined rigid retarder blade having an operating face angle in the range of 5° to 15° and which is positioned on the side of the web not facing the primary blade and which retards the forward movement of the web and dislodges the web from the surface of the rotating drum, the improvement comprising dislodging the web from the rotating drum with a retarder blade having a razor edge wherein the edge of the retarder blade is directly below or overlapped by the end of the rigid primary blade and wherein the operating face of the retarder blade is an uninterrupted surface.

4,919,878

PROCESS FOR THE PRODUCTION OF POLYURETHANE-AND/OR POLYUREA-BASED MOLDINGS

Friedhelm Pilger; Richard Kopp, both of Cologne, and Otto Ganster, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen Bayerwerk, Fed. Rep. of Germany

Filed Aug. 3, 1987, Ser. No. 81,043

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1986, 3627078

Int. Cl.[5] B29C *45/00*

U.S. Cl. 264—300 **6 Claims**

1. A process for the production of a molding having a compact surface by reacting in a closed mold a reaction mixture comprising

(a) an organic polyisocyanate,

(b) a compound containing isocyanate-reactive groups and having a molecular weight of 62 to about 10,000 and

(c) a mold release agent comprising a salt of

(i) a compound containing (on a statistical average) at least 8 carbon atoms per molecule and comprising a member selected from the group consisting of saturated aliphatic carboxylic acids, uusaturated aliphatic carboxylic acids, saturated cycloaliphatic carboxylic acids, unsaturated cycloaliphatic carboxylic acids and mixtures thereof and

(ii) at least one tertiary amine corresponding to the formula

wherein

R_1 comprises a member selected from the group consisting of saturated, aliphatic hydrocarbon radicals containing at least 12 carbon atoms and unsaturated, aliphatic hydrocarbon radicals containing at least 12 carbon atoms and

R_2 comprises a member selected from the group consisting of saturated, aliphatic hydrocarbon radicals containing from 1 to 18 carbon atoms, unsaturated, aliphatic hydrocarbon radicals containing from 1 to 18 carbon atoms, C_2–C_{40} hydroxyalkyl radicals, C_2–C_{40} hydroxyalkyl radicals containing ether bridges and mixtures thereof and

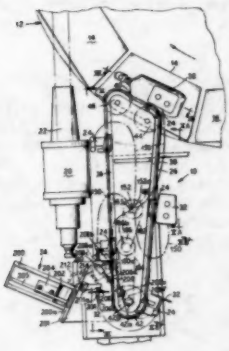
R_3 comprises a member selected from the group consisting of saturated, aliphatic hydrocarbon radicals containing from 1 to 18 carbon atoms, unsaturated, aliphatic hydrocarbon radicals containing from 1 to 18 carbon atoms; C_2–C_{40} hydroxyalkyl radicals, C_2–C_{40} hydroxyalkyl radicals containing ether bridges and mixtures thereof.

4,919,879

METHOD FOR IN-MOLD LABELING OF A BLOW MOLDED ARTICLE

Frank T. Keyser, Sycamore, Ill., assignor to Liquid Container Corporation, West Chicago, Ill.

Division of Ser. No. 137,182, Dec. 23, 1987, Pat. No. 4,834,641. This application Feb. 21, 1989, Ser. No. 312,717
Int. Cl.[5] B29C 49/24
U.S. Cl. 264—509 1 Claim



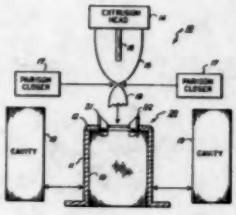
1. The method of blow molding which includes the steps of:
continuously and sequentially moving a plurality of molds through a first closed circuit;
at one point in said first closed circuit continuously forming a parison of moldable plastic material;
each mold being open at said one point in the first closed circuit;
drawing off a portion of the parison into a cavity of each respective mold at said one point in the first closed circuit to charge each mold;
thereafter closing each mold;
introducing a gaseous medium into each parison portion within each charged mold to expand each parison portion against walls of each respective mold cavity to form a hollow object corresponding in size and shape to the mold cavity;
at a second point in the first closed circuit opening each mold and ejecting the hollow object therefrom to condition the mold for repeating the cycle;
continuously and sequentially moving a plurality of carriages through a second closed circuit;
at one point in the second closed circuit picking up one or more labels from a label supply station for transport on each carriage;
intersecting the two closed circuits at a matched segment in both circuits with the molds open following ejection of the hollow objects and prior to said one point in said first closed circuit;
moving each open mold and a carriage through the matched segment in unison at zero relative velocity;
transferring said one or more labels from each carriage to a corresponding mold during the unison movement through the matched segment; and
synchronously driving both of said first and second circuits in unison from a common power source;
thereby to continuously effect in-mold labeling of all of the articles molded in the first closed circuit.

4,919,880

CORE PINCH-OFF FOR BLOW MOLDING PARISON

George F. Arp, 27 Terrace Villa Cir., Fairport, N.Y. 14450

Continuation-in-part of Ser. No. 868,294, May 28, 1986. This application Aug. 11, 1986, Ser. No. 895,329
Int. Cl.[5] B29C 49/18, 49/30, 49/04
U.S. Cl. 264—536 10 Claims



1. Apparatus for pinching off a blow molding parison, said apparatus comprising:
a. a core arranged between openable and closeable blow mold parts, which blow mold parts, upon closing around said core, form a cavity in which said parison can be blown in a double-walled form conforming to an outside surface of said core and an inside surface of said cavity;
b. said core having a hollow interior arranged under said parison for receiving a leading end of said parison;
c. a top region of said core having a pinch-off means including clamp jaws that are mounted on said core for movement relative to said core between an open and a closed position of said clamp jaws;
d. means for directing said leading end of said parison through said clamp jaws and into said hollow interior while said clamp jaws are in said open position;
e. means for moving said clamp jaws relative to said core from said open position to said closed position for closing said clamp jaws to pinch off and hold said leading region of said parison at said top region of said core while a following region of said parison lowers over said top region of said core; and
f. said pinch-off clamp jaws being arranged in said closed position to form an upper portion of said outside surface of said core, against which said parison conforms when blown.

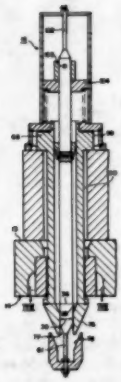
5. A method of pinching off and holding a leading region of a blow molding parison, said method comprising:
a. arranging on a top region of a hollow core a pinch-off clamp including clamp jaws movable away from and toward each other between respective open and closed positions relative to said top region of said hollow core disposed between openable and closeable blow mold parts, which blow mold parts, upon closing around said core, form a cavity for blow molding said parison to conform to an outer surface of said core and an inner surface of said cavity;
b. directing a leading end of said parison into said pinch-off clamp while said pinch-off clamp is in an open position;
c. moving said clamp jaws toward each other on said top region of said core for closing said pinch-off clamp jaws against said leading region of said parison for closing and holding said parison at said top region of said core while a succeeding region of said parison lowers over said outer surface of said top region of said core; and
d. forming said pinch-off clamp so that, in a closed position, said pinch-off clamp forms an upper portion of said outer surface of said core.

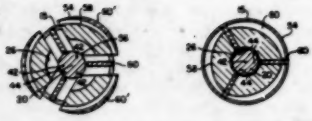
4,919,881

REACTOR INTERNALS THROUGH-HOLE GRAPPLE

Michael F. Hankinson, Monroeville; Kenneth J. Swidwa, North Versailles, and Robert B. Salton, Plum Borough, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 5, 1988, Ser. No. 215,116
Int. Cl.[5] G21C *19/20*
U.S. Cl. 376—260 41 Claims





24. An improved reactor internals lifting rig including a reactor internals through-hole grapple device for lifting and transporting an internals structure of a nuclear reactor, the internals structure including a radial flange thereon having a top and bottom surface with a plurality of holes therebetween, said internals throughhole grapple device comprising:

a generally vertically disposed cylindrical housing adapted to be secured to the lifting rig;

a generally vertically oriented grapple assembly having its upper end partially disposed within the housing and the lower and projecting substantially below the housing and the lifting rig, the lower end of the grapple assembly having an outwardly directed annular shoulder with an upper surface thereon which is adapted to pass through one of said holes and adjacent to the bottom surface of the radial flange, the grapple assembly having a retracted position and an expanded position wherein when in the retracted position the annular shoulder is smaller in diameter than said hole and when in the expanded position the annular shoulder is larger in diameter than said hole such that the upper surface of the annular shoulder is in abutting contact with the bottom surface of the radial flange of the internals structure, wherein the grapple assembly further comprises:

(i) a plurality of circumferentially disposed fingers each having a first inner arc segment on one end and a second inner arc segment at the opposite end with a tapered transition zone therebetween, and a first outer arc segment adjacent the tapered transition zone and a second outer arc segment adjacent the first inner arc segment, said first inner and outer arc segments being formed with respect to a first axis, and said second inner and outer arc segments being formed with respect to a second axis offset from the first by a predetermined distance and parallel thereto so that said first and second outer arc segments are not concentric with respect to each other, whereby said fingers cooperate to provide a first inner diameter formed by said first inner arc segments, a second inner diameter formed by said second inner arc segments, the annular shoulder having a first outer diameter smaller than that of the hole when in the retracted position and having a top surface with an outer boundary being formed by said first outer arc segments, a second outer diameter formed by said second outer arc segments and forming an inner boundary of the annular shoulder; and

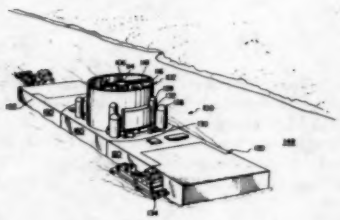
(ii) actuating means engaging said fingers to radially expand said fingers into abutting contact with the bottom surface of the radial flange.

4,919,882

MODULAR NUCLEAR STEAM SUPPLY SYSTEM AND METHOD OF CONSTRUCTING A NUCLEAR REACTOR USING A MODULAR NUCLEAR STEAM SUPPLY SYSTEM

Raymond J. Aul; Robert L. Howell, and Lawrence W. Ramsey, all of Jacksonville, Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 21, 1983, Ser. No. 544,193
Int. Cl.[5] G21C *13/00*
U.S. Cl. 376—293 17 Claims



1. A method of fabricating a nuclear reactor comprising the steps of:

manufacturing, at a manufacturing site, a nuclear steam supply system (NSSS) module comprising a barge having a bulkhead with means for reinforcing said bulkhead, an NSSS portion, and a reactor safeguards portion;

constructing, at a reactor site remote from said manufacturing site and in parallel with said manufacturing step, a containment building have at least one construction opening sized to pass said NSSS portion, a base mat for supporting said NSSS portion, and means for reinforcing said containment building, said bulkhead having a generally complementary geometry with respect to said construction opening;

transporting said module to said reactor site; and

installing at least the NSSS portion of said module in said containment building by passing said NSSS portion through said opening, anchoring said NSSS portion to said base mat, at least partially closing said opening with said bulkhead, and coupling said bulkhead reinforcing means to said containment building reinforcing means, with at least a portion of said reactor safeguard portion being disposed outside said containment building.

9. A nuclear steam supply system (NSSS) module comprising:

a low draft barge having an NSSS portion and an associated reactor safeguards system portion, said NSSS portion being adapted to fit within a preformed containment building having a liner with at least one construction

opening dimensioned to pass said NSSS portion therethrough;

said badge having at least one bulkhead separating said NSSS portion from said reactor safeguards systems, said bulkhead having a generally complementary geometry with respect to said construction opening and being formed to cooperate with said liner to close said construction opening;

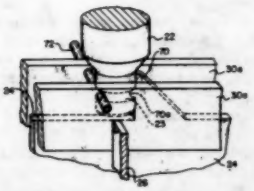
said bulkhead containing preformed containment penetrations for communicating with said reactor safeguard system portion.

4,919,883

LOWER END FITTING DEBRIS COLLECTOR AND END CAP SPACER GRID

William J. Bryan, Granby, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 14, 1988, Ser. No. 284,018
Int. Cl.[5] G21C *19/30, 3/32*
U.S. Cl. 376—352 **1 Claim**



1. In a nuclear reactor having fuel assemblies including an upper end fitting and spaced nuclear fuel rod spacer grids for supporting and spacing a plurality of elongated nuclear fuel rods, each of which includes a hollow active portion of nuclear fuel filled cladding intermediate the rod ends and tapering end cap of solid material with a circumferential groove on the rod end which first encounters reactor coolant flow, a lower end filtering debris collector and end cap spacer grid for capturing and retaining deleterious debris carried by reactor coolant before it enters the active region of a fuel assembly and creates fuel rod cladding damage, comprising in combination:

a polygonal perimeter member,

a plurality of debris trapping compartments defined by a plurality of parallel first slotted bars and parallel second slotted bars intersecting and slottedly interlocked with said first bars in a grid-forming arrangement in which the bars are attached to said perimeter member and to each other,

a first plurality of parallel strips mounted on said second bars and between said first bars on a first side of said grid,

a second plurality of parallel strips mounted on said first bars and between said second bars on the side thereof opposite said first side of said grid in an orientation normal to said first plurality of parallel strips,

at least some of said bars including projecting portions engaging said end caps at a first circumferential location thereof,

spring means secured to said grid formed by said bars by means of at least some of said strips and engaging the circumferential grooves at a second circumferential location opposite said first,

said spring means securing strips projecting upwardly adjacent the end caps to provide end cap lateral movement restraining walls and to define an end cap spacer grid compartment with the circumferentially opposite bar projecting portions and spring means.

4,919,884

MODULAR NUCLEAR FUEL ELEMENT, MODULAR CAPSULE FOR SUCH ELEMENT AND METHOD FOR SUCH ELEMENT AND METHOD FOR MANUFACTURING SUCH MODULAR CAPSULE

Alain Chotard, Neuville sur Saone, France, assignor to Framatome, Courbevoie and Cogema, Velizy Villacoublay, both of, France

Filed Jun. 23, 1988, Ser. No. 210,443
Claims priority, application France, Jun. 25, 1987, 87 08988
Int. Cl.[5] G21C *3/00*
U.S. Cl. 376—419 **11 Claims**

1. A nuclear fuel element comprising a tubular sheath having opposite ends and composed of a material resisting creep and corrosion under the action of a coolant at high pressure and high temperature of a nuclear reactor means closing said opposite ends pellets enclosed in the sheath and composed of a material having an influence on the nuclear reaction in a reactor, at least a part of which material is of fuel material, said element further comprising a plurality of modular capsules arranged one after the other axially within the sheath, each of the modular capsules comprising a tubular case having opposite ends, a porous element closing each of said opposite ends of the case and a stack of said pellets inserted without radial clearance inside the case, the case having an outside diameter which is such that, the radial clearance between the outer surface of the capsule and the inner, surface of the sheath is in the range between 0.02 and 0.2 millimeter

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4,919,885

CORROSION RESISTANT STEEL STRUCTURAL MEMBER

Lutz Meyer, Voerde; Ludwig Hachtel, Wesel-Büderich, and Günter Robusch, Essen, all of Fed. Rep. of Germany, assignors to Thyssen Stahl AG, Duisburg, Fed. Rep. of Germany

Continuation of Ser. No. 81,505, Aug. 4, 1987, abandoned. This application Sep. 28, 1988, Ser. No. 252,006
Claims priority, application Fed. Rep. of Germany, Aug. 14, 1986, 3627668
Int. Cl.[5] C22C *38/14*
U.S. Cl. 420—104 **6 Claims**

1. In a structural member of hot blast stoves, heat exchangers, furnaces, boilers, tanks, vessels and pipes exposed to intergranular stress corrosion cracking in nitrate-containing solutions, constructed of a weldable structural steel, wherein the improvement comprises that the structural steel having high resistance to intergranular stress corrosion cracking in nitrate-containing solutions and good weldability, consists essentially in % by mass, of

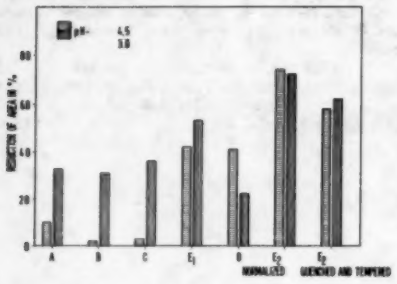
0.01 to 0.04 % carbon

up to 0.012 % nitrogen

0.08 to 0.22 % titanium with Ti equal or greater than 3.5 (carbon + nitrogen)

0.2 to 2.5 % manganese

2.0 to 5.5 % chromium
0.01 to 0.10 % aluminium
up to 0.5 % silicon
up to b 1.0 % nickel



up to 0.02 % phosphorus
up to 0.02 % sulphur,
the residue being iron and unavoidable impurities.

4,919,886

TITANIUM ALLOYS OF THE Ti_3AL TYPE

Ganapathy Venkataraman, Fairborn, and Francis H. Froes, Xenia, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 10, 1989, Ser. No. 335,631
Int. Cl.[5] C22C *14/00*
U.S. Cl. 420—420 **5 Claims**

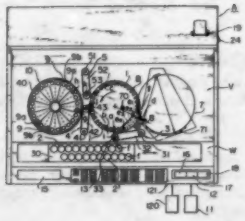
1. A titanium alloy consisting essentially of about 20 to 30 atomic percent aluminum, about 3 to 5 atomic percent niobium, about 3 to 5 atomic percent vanadium and about 3 to 5 atomic percent molybdenum, balance titanium.

4,919,887

AUTOMATIC ANALYZER

Koichi Wakatake, Koganei, Japan, assignor to Nittec Co., Ltd., Tokyo, Japan

PCT No. PCT/JP87/00679, § 371 Date Apr. 20, 1988, § 102(e) Date Apr. 20, 1988, PCT Pub. No. WO88/02120, PCT Pub. Date Mar. 24, 1988
PCT Filed Sep. 16, 1987, Ser. No. 184,637
Claims priority, application Japan, Sep. 16, 1986, 61-216011; Sep. 19, 1986, 61-219174; Oct. 3, 1986, 61-234295; Jan. 19, 1987, 62-8112; Feb. 12, 1987, 62-17750
Int. Cl.[5] G01N *35/00*
U.S. Cl. 422—67 **3 Claims**



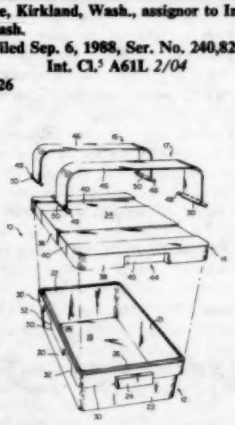
1. A multi-item automatic analyzer which comprises:
a reaction cell table holding a plurality of reaction cells;
means for repetitively rotating said table for moving each cell from a sampling position successively through a reagent dispensing position and an optical measuring position to a washing position;
a sampling mechanism at said sampling position for placing a sample to be analyzed into a reaction cell;
a reagent dispensing mechanism at said reagent dispensing position for dispensing a reagent into a reaction cell;
an optical measuring mechanism at said optical measuring position for making optical measurements of samples in the reaction cells passing said optical measuring position;
a washing mechanism at said washing position for washing reaction cells;
a control device connected to said table rotating means, said sampling mechanism, said reagent dispensing mechanism, said optical measuring mechanism and said washing mechanism for operating said means and said mechanisms for carrying out a desired analysis on the respective samples in the respective reaction cells;
an initiating IC card processing means for reading a predetermined analysis operation for a particular sample to be analyzed which has been stored on an initiating IC card which is insertable into said initiating IC card processing means;
a memory IC card processing means for recording data on a memory IC card which is insertable into said memory IC card processing means;
said initiating IC card processing means being connected to said control device for causing said control device to control said table rotating means and said mechanisms to carry out the predetermined analysis and being connected to said memory IC card processing means for recording the predetermined analysis operation on a memory IC card; and
said memory IC card processing means further being connected to said control device and said optical measuring means for recording the actual analysis operation carried out by said analyer and the results of the optical measurements on the same memory IC card.

4,919,888

SEALS AND METHOD OF SEALING FOR A STERILIZATION CONTAINER SYSTEM

Jerry L. Spence, Kirkland, Wash., assignor to InstruMed, Inc., Kirkland, Wash.

Filed Sep. 6, 1988, Ser. No. 240,820
Int. Cl.[5] A61L *2/04*
U.S. Cl. 422—26 **17 Claims**



1. A method of using at least one seal means for sealing a sterilization container system means, wherein said at least one seal means comprises a pair of anchor means and a belt means of shrinkable material having a pair of belt ends, wherein each of said anchor means is secured to a respective one of said belt ends;
wherein said sterilization container system means is for holding at least one object while said at least one object is

being sterilized; wherein said sterilization container system means comprises a base means, a lid means and a gasket means adapted to provide a selectively releaseable seal between said base means and said lid means; wherein said base means has a bottom wall means, a pair of opposed side wall means extending upwardly from said bottom wall means, and a pair of opposed end wall means extending upwardly from said bottom wall means; wherein each of said side wall means includes an anchor engaging means for selectively engaging a respective one of said anchor means;

wherein said method comprises the steps of:

a. engaging a first one of said anchor means in a respective first one of said anchor engaging means;

b. passing said belt means across a top surface of said lid means of said sterilization container system means while said first one of said anchor means is engaged in said respective first one of said anchor engaging means;

c. engaging a second one of said anchor means in a respective second one of said anchor engaging means, while said first one of said anchor means is engaged in said respective first one of said anchor engaging means;

d. placing said sterilization container system means bearing said at least one seal means into a device for sterilizing said sterilization container system means and said at least one object;

e. exposing said sterilization container system means bearing said at least one seal means to at least one sterilizing means. within said device for sterilizing until said sterilization container system means and said at least one object is sterilized and until said belt means shrinks to the point that said at least one seal means urges said base means, said lid means and said gasket means firmly together to provide a selectively releaseable microorganism proof seal between said base means, said lid means and said gasket means to prevent microorganisms from entering an interior space of said sterilization container system means; and wherein said at least one sterilizing means within said device for sterilizing acts to sterilize said sterilization container system means and said at least one object and acts to simultaneously shrink said belt means of said at least one seal means.

4,919,889

SAMPLE COLLECTION AND TRANSPORT FLUID COMPOSITION

Lynn A. Jones, Mountain View; Lloyd H. Smith, Davis, and Nelson N. H. Teng, Hillsborough, all of Calif., assignors to Aspen Diagnostics Corporation, Sunnyvale, Calif.

Filed Sep. 15, 1988, Ser. No. 244,984

Int. Cl.[5] B01J *11/18*; G01N *1/00*; A01N *1/02*

U.S. Cl. 422—40 **16 Claims**

1. An aqueous solution for preserving sensitive proteins in human biological secretion samples consisting essentially of

(a) from 0.05 to 0.5 M of a buffer which is effective to maintain the solution pH within the range of from 6.5 to 8.0;

(b) from 0.1 to 10 wt. % of a non-immune animal protein selected from the group consisting of albumin, ovalbumin, casein, glycoprotein and mixtures thereof;

(c) from 40 to 2000 kallikrein units/mL of an enzyme inhibitor of trypsin, chymotrypsin, kallikrein or plasmin; and

(d) from 0.01 to 0.1 wt. % of a bacteriostatic agent.

4,919,890

DRY TYPE ANALYSIS ELEMENT

Fuminori Arai, Saitama, and Fusae Osada, Kanagawa, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

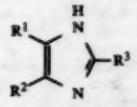
Filed Apr. 4, 1988, Ser. No. 177,287

Claims priority, application Japan, Apr. 2, 1987, 62-82061; Apr. 3, 1987, 62-82285

Int. Cl.[5] G01N *1/48*

U.S. Cl. 422—56 **17 Claims**

1. A dry type analysis element for detecting a specific constituent in a liquid which comprises a light-transmissive support having thereon at least one water-penetrative layer and at least one of said water-penetrative layer(s) containing a composition capable of interacting with said specific constituent in said liquid, wherein said composition contains salts of a leuco dye comprising at least one compound selected from the group consisting of compounds represented by formula (I)



(I)

wherein

R^1 represents a substituted or unsubstituted aryl group,

R^2 represents a substituted or unsubstituted alkyl group, and

R^3 represents a substituted or unsubstituted aryl group, said salts being salts of at least two acids

and said salts of said leuco dye being dissolved in a hydrophobic solvent to form a solution that is contained in said water-penetrative layer as a dispersion in a hydrophilic medium.

4,919,891

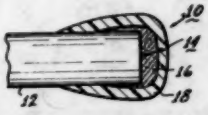
SENSOR WITH OVERCOATING AND PROCESS FOR MAKING SAME

Masao Yafuso, El Toro; Henry K. Hui; Cheng F. Yan, both of Irvine, and William W. Miller, Santa Ana, all of Calif., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 853,460, Apr. 18, 1986, abandoned, and a continuation-in-part of Ser. No. 917,912, Oct. 10, 1986, Pat. No. 4,824,789, and a continuation-in-part of Ser. No. 917,913, Oct. 10, 1986, Pat. No. 4,798,738. This application May 15, 1987, Ser. No. 49,844

Int. Cl.[5] G01N *21/64*

U.S. Cl. 422—58 **39 Claims**



1. A sensor comprising a sensing element capable of sensing a component in an aqueous medium and an overcoating at least partially covering said sensing element, said overcoating comprising a water insoluble, component permeable cellulosic material cross-linked with one or more multi-functional cross-linking agents and an effective amount of an opaque agent.

4,919,892

APPARATUS FOR DETECTING OIL AND OTHER LIGHTER-THAN-WATER CONTAMINANTS IN AN EFFLUENT STREAM

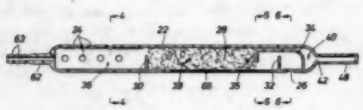
Arnold D. Plumb, P.O. Box 35646, Tulsa, Okla. 74153

Continuation-in-part of Ser. No. 203,416, Jun. 7, 1988, Pat. No. 4,863,692. This application Jun. 22, 1989, Ser. No. 369,770

The portion of the term of this patent subsequent to Sep. 5, 2006, has been disclaimed.

Int. Cl.[5] G01N *33/28*

U.S. Cl. 422—58 **15 Claims**



1. An apparatus for continuously detecting the presence of oil and other contaminants in an effluent stream passing through a pipeline comprising:

a housing having an inlet and an outlet;

oleophilic means supported within said housing and positioned so that at least a portion of the effluent stream enters said housing through said inlet and passes through said oleophilic means;

means for directing the flow of the effluent stream within said housing; and

a tube having one end in fluid communication with the interior of said housing and having another end substantially restricted, said tube positioned to collect and display the presence of oil absorbed by said oleophilic means.

4,919,893

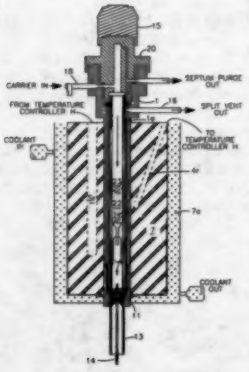
THERMAL EXTRACTION/PYROLYSIS GAS CHROMATOGRAPH

Eric L. Bandurski; Phach F. N. Vu, and Gary D. Bruce, all of Tulsa, Okla., assignors to Amoco Corporation, Chicago, Ill.

Filed May 31, 1988, Ser. No. 201,132

Int. Cl.[5] G01N *31/12*

U.S. Cl. 422—78 **2 Claims**



1. A method for converting a nonthermal extraction pyrolysis gas chromatograph into a thermal extraction pyrolysis gas chromatograph,

the nonthermal extraction pyrolysis gas chromatograph comprising an inlet assembly with a sample flow path comprising an insert chamber for receiving a sample insert having a sample therein and flow defining means for directing flow of gas through the insert chamber to a gas chromatographic column, and the inlet assembly further comprising a heater for controlling the temperature of the inlet assembly,

the method comprising:

adapting a temperature control assembly for replacing the heater in the nonthermal extraction gas chromatograph and for receiving the insert chamber of the nonthermal extraction pyrolysis gas chromatograph without modifying the sample flow path of the nonthermal extraction pyrolysis gas chromatograph, the temperature control assembly comprising a furnace for controllably heating the sample insert to thermal extraction and pyrolysis temperatures and a cooling means for controlling the temperature of the inlet assembly and for returning the temperature of the inlet assembly to initial state conditions following use of the apparatus,

replacing the heater with the thus-adapted temperature control assembly, and

maintaining the sample flow path of the nonthermal extraction pyrolysis gas chromatograph substantially without modification.

4,919,894

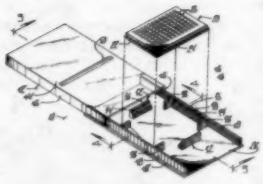
MULTIPLE SAMPLE HOLDER INDEXING MEANS AND METHOD OF USING SAME

Robert Daniel, 805 NW. Greenwood, Ankeny, Iowa 50021

Filed May 23, 1988, Ser. No. 197,619

Int. Cl.[5] B01C *9/00*

U.S. Cl. 422—104 **5 Claims**



1. An indexing means for a sample container having multiple sample holders comprising:

a cover having a top and two opposite sidewalls extending downwardly from the top;

said cover sidewalls of a distance opposite one another to allow said cover to slide over a sample container having multiple sample holders;

a base plate having first and second sidewalls of a distance opposite one another narrower than the distance between said cover sidewalls, said second sidewalls wider than said sample container and allowing said cover to slide along said second sidewalls;

a pair of supports located on said base plate opposite each other, said supports of a height and distance from one another to support said sample container;

said supports having multiple stepped ledges so that said sample containers of various sizes can be supported;

an opening within said top allowing access to at least a portion of said sample holders when said cover is placed over said sample container, so that said cover may slide back and forth over said sample container allowing selective covering of a portion of said sample holders while allowing access to another portion of said sample holders.

4,919,895

APPARATUS FOR OXYGENATION OF LIQUID STATE DISSOLVED OXYGEN-CARRYING FORMULATION

Charles M. Heldebrant, Arcadia; Kim C. Crowe, Northridge; George R. Groveman, Clairmont, and Charles H. Davis, Jr., Mission Viejo, all of Calif., assignors to Alpha Therapeutic Corporation, Los Angeles, Calif.

Division of Ser. No. 910,521, Sep. 23, 1986, Pat. No. 4,769,241.
This application Jun. 18, 1987, Ser. No. 64,344
Int. Cl.[5] A61M *37/00*
U.S. Cl. 422—129 14 Claims

1. An oxygenation system for the oxygenation of a perfluorocarbon emulsion formulation comprising:

(a) a sealed container having an interior chamber containing a perfluorocarbon emulsion formulation, the container having a sealed multi-purpose port;

(b) a three-way valve having one inlet and at least one outlet, with at least one outlet being connected to the multi purpose port of the container for communication with the interior chamber of the container;

(c) a filter having an inlet and an outlet, the outlet being connected to the inlet of the three-way valve; and

(d) a gas reservoir assembly including a gas reservoir of known volume for containing an oxygen-containing gas and having at least one port connected to the inlet of the filter.

4,919,896

MULTISTAGE CATALYTIC REACTOR SYSTEM FOR PRODUCTION OF HEAVY HYDROCARBONS

Mohsen N. Harandi, Lawrenceville; Hartley Owen, Belle Mead, and Samuel A. Tabak, Wenonah, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 137,913, Dec. 28, 1987, Pat. No. 4,788,366. This application Oct. 20, 1988, Ser. No. 260,348
Int. Cl.[5] B01J *8/04, 8/18*
U.S. Cl. 422—142 6 Claims

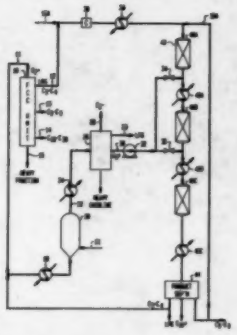
1. A multistage catalytic system for conversion of light olefinic gas feedstock to distillate range hydrocarbons rich in $C_{10}+$ aliphatics and alkylated aromatics, comprising:

(a) first reactor means for maintaining a fluidized bed of hydrocarbon conversion catalyst particles in a primary reaction stage in a turbulent reactor bed maintained under reaction severity conditions effective to convert a primary light olefin feedstream including means for passing hot feedstock vapor upwardly through the fluidized catalyst bed at reaction severity conditions sufficient to convert light olefins substantially to C_5+ hydrocarbons, including intermediate range olefins and aromatics;

(b) fractionation means operatively connected to receive effluent from the primary reaction stage for separating and recovering primary stage effluent to provide a liquid stream containing a major amount of said C_5+ hydrocarbons;

(c) second reactor means for contacting a secondary olefinic feedstream in a secondary catalytic reactor stage with oligomerization catalyst in a series of fixed catalyst bed high pressure reactors under distillate mode oligomerization conditions; and

(d) fluid handling means for mixing at least a portion of said liquid C_5+ stream recovered from the primary stage effluent with at least one hot inter-reactor stream containing partially upgraded olefins between at least two reactors of said series of fixed catalyst reactors in the secondary stage, thereby quenching said inter-reactor stream and coreacting said mixed stream containing partially upgraded olefins and intermediate primary stage hydrocarbons in at least one secondary stage reactor to provide distillate range hydrocarbon product.

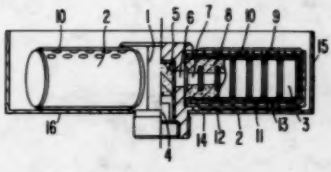


4,919,897

GAS GENERATOR FOR AIR BAG

Richard Bender, Lauf, and Gerrit Scheiderer, Furth, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisorf, Fed. Rep. of Germany

Filed May 23, 1988, Ser. No. 197,272
Claims priority, application Fed. Rep. of Germany, May 22, 1987, 3717249; Dec. 16, 1987, 3742656
Int. Cl.[5] B60R *21/26*
U.S. Cl. 422—165 9 Claims



1. A gas generator for an air bag, comprising a plurality of pressure tanks in communication with an igniter element wherein, after initiation of the igniter element, a gas-releasing material is burnt up in the pressure tanks and the gas flows through filter-covered apertures in the wall of the pressure tanks into an air bag inverted thereover, characterized in that at least two tubular pressure tanks are attached radially to a central member containing the igniter element, the gas-releasing material, in the form of stackable moldings in each tank, substantially fill out a tubular cross section of the tank and are arranged to form a columnar packing, and at least one gas channel is present in each columnar packing.

4,919,898

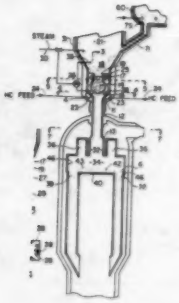
PARTICULATE SOLIDS CRACKING APPARATUS

Robert J. Gartside, Wellesley, and Richard C. Norton, Boston, both of Mass., assignors to Stone & Webster Engineering Corp., Boston, Mass.

Division of Ser. No. 84,328, Aug. 11, 1987, Pat. No. 4,814,067. This application Sep. 12, 1988, Ser. No. 243,462

Int. Cl.[5] B01J *8/08*

U.S. Cl. 422—219 **6 Claims**



1. A cracking reactor comprising:

(a) centrally offset orifices for delivery of particulate solids to the reactor;

(b) at least two hydrocarbon feed inlet nozzles located in the reactor sidewall in the same plane;

(c) a centrally disposed plug member in the reactor for the particulate solids to flow around upon entry into the reactor, the bottom of which plug member is at the elevation at which the hydrocarbon feed nozzles are located; and

(d) a venturi shaped section between the solids or fices and the hydrocarbon feed inlets.

4,919,899

CRYSTAL GROWTH APPARATUS

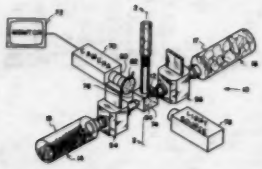
Frederick T. Herrmann, 10006 Covington Dr., Huntsville, Ala. 35803, and Blair J. Herren, 109 9th Pl. N.E., Arab, Ala. 35016

Filed Feb. 29, 1988, Ser. No. 161,681

The portion of the term of this patent subsequent to Dec. 12, 2006, has been disclaimed.

Int. Cl.[5] C30B *35/00, 23/00, 29/54, 7/02*

U.S. Cl. 422—245 **11 Claims**



1. An apparatus for growing crystals comprising:

a sealable enclosure having first and second openings;

infinitely variable valve means coupled to said openings and disposed for controlling passage of gases therethrough;

fluid support means positioned in said enclosure, said fluid support means having a surface disposed for supporting a drop of fluid, said drop including a crystalline material dissolved therein;

a source of solvent vapor coupled via said valve means to said first opening, for selectively supplying solvent in a vapor phase to said drop, decreasing concentration of said dissolved crysta.line material; and

a source of desiccant coupled via said valve means to said second opening, for selectively removing solvent in a vapor phase from said drop, increasing the concentration of said dissolved crystalline material.

4,919,900

SYSTEM FOR CRYSTAL GROWTH, PARTICULARLY FOR SPACE VESSEL

Gérard M. Martin, Valenciennes; Manuel P. Claramonte, Chaville; Jean-Claude Auffret, Chapet; Guy M. Bonnet, Poissy, and Jean-Jacques Delarue, Velizy Villa-Coublay, all of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France

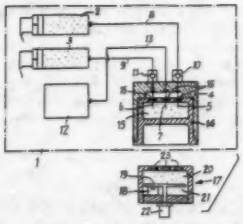
PCT No. PCT/FR88/00121, § 371 Date Oct. 3, 1988, § 102(e) Date Oct. 3, 1988, PCT Pub. No. WO88/06648, PCT Pub. Date Sep. 7, 1988

PCT Filed Mar. 3, 1988, Ser. No. 274,052

Claims priority, application France, Mar. 4, 1987, 87 02947

Int. Cl.[5] B01D *9/00*; C30G *29/54, 35/00*; C30B *7/00*

U.S. Cl. 422—245 **18 Claims**



1. System of crystal growth by diffusion, in which a substance to be crystallized, contained in a crucible, is brought into the presence of a precipitating agent, comprising:

(a) at least one receptacle provided with first and second needles;

(b) supply means for a precipitating agent and connected to said first needle;

(c) evacuating means for said precipitating agent and connected to said second needle;

(d) at least one removable capsule having septa and enclosing at least one crucible for receiving a precipitating agent and a substance to be crystallized, said capsule being introduced into said receptacle in such a way that said first and second needles perforate said septa such that said supplying and evacuating means are so connected to the interior of said capsule via said first and second needles;

(e) a removable plug introduced into said receptacle in place of said capsule, said plug comprising a septa and a spongy body imbibed with precipitating agent, said septa and spongy body pierced by said first and second needles; and

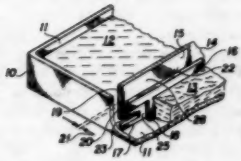
(f) a first controllable obturator provided inside said capsule to selectively obturate said crucible to isolate contents from an interior cavity of said capsule, or to open said crucible and place the contents in communication with the cavity of the capsule.

4,919,901

BARRIER DESIGN FOR CRUCIBLES FOR SILICON DENDRITIC WEB GROWTH

Raymond G. Seidensticker, Forest Hills; Edgar L. Kochka, Greentree, and Charles S. Duncan, Penn Hills, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 31, 1987, Ser. No. 140,071
Int. Cl.[5] C30B 35/00
U.S. Cl. 422—249 20 Claims



1. A crucible for growing silicon dendritic web crystals, said crucible including a feed region and a growth region, said crucible further including a barrier separating said feed region from said growth region, said barrier comprising a primary and a secondary barrier, said secondary barrier being separated from, and substantially parallel to, said primary barrier, said primary and secondary barriers each including a flow opening through which liquid silicon may flow from said feed region to said growth region.

4,919,902

CATALYST FOR TREATMENT OF EXHAUST GASES FROM INTERNAL COMBUSTION ENGINES

Maureen L. Bricker, Buffalo Grove, and R. Joe Lawson, Palatine, both of Ill., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Division of Ser. No. 102,967, Sep. 30, 1987, Pat. No. 4,791,091. This application Nov. 9, 1988, Ser. No. 269,389
Int. Cl.[5] B01D 53/36
U.S. Cl. 423—213.5 11 Claims

1. A process for the treatment of exhaust gases which comprises contacting said gases with a catalytic composite comprising a support which is a refractory inorganic oxide selected from the group consisting of alumina, silica, titania, zirconia, aluminosilicates and mixtures thereof, having dispersed thereon lanthanum oxide, the lanthanum oxide being dispersed on said support by the method of commingling a solution of a lanthanum salt with a hydrosol of the metal precursor of said support, forming particles from said lanthanum containing hydrosol, calcining said particles to form a particulate support containing lanthanum oxide, having an average crystallite size of less than 25 Angstroms, at least one other rare earth oxide and at least one noble metal component selected from the group consisting of platinum, palladium, rhodium, ruthenium and iridium.

4,919,903

METHOD OF CATALYTICALLY OXIDIZING METHANOL VAPOR ACCOMPANIED BY LITTLE OR NO EXCESS OXYGEN

Haren S. Gandhi, and Eugene C. Su, both of Farmington Hills, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 20, 1986, Ser. No. 921,027
Int. Cl.[5] B01D 53/36
U.S. Cl. 423—213.5 8 Claims

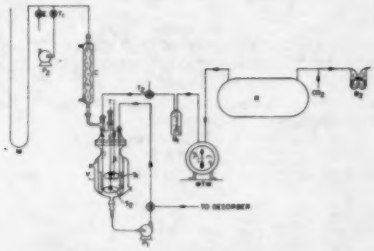
1. A method of substantially completely catalytically oxidizing methanol vapor and/or formaldehyde vapor contained in a carrier gas heated to a temperature of 85°-200° C. and having excess oxygen in an amount less than 0.5% by weight of the stoichiometric oxygen required for complete oxidation of said methanol vapor, comprising the treatment of said gas mixture by means of a dispersed catalyst consisting of palladium and of (i) rhodium in a weight ratio of Rh/Pd of 0-0.3, and/or (ii) CeO_2 in a weight ratio of CeO_2/Pd of 0-50, said treatment converting at least 96% of the methanol to CO_2 and water vapor and yielding less than 1% of converted methanol as aldehydes.

4,919,904

PRIMARY HINDERED AMINOACIDS FOR PROMOTED ACID GAS SCRUBBING PROCESS

Larry J. Shulik, Somerville; Guido Sartori; W. S. Winston Ho, both of Annandale; Warren Thaler, Flemington, and George E. Milliman, Fanwood, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Division of Ser. No. 93,734, Sep. 8, 1987, Pat. No. 4,759,866, which is a continuation of Ser. No. 852,322, Apr. 15, 1986, abandoned. This application Apr. 11, 1988, Ser. No. 179,995
Int. Cl.[5] C01B 17/16, 31/20, 17/00; C01C 3/00
U.S. Cl. 423—225 12 Claims

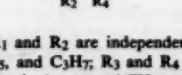


1. A process for removing CO_2 and other acid gases from a normally gaseous mixture, which process comprises:

(a) contacting the normally gaseous mixture under absorption conditions with an aqueous scrubbing solution comprising:

(i) one or more alkali metal salts; and

(ii) as he sole sterically hindered amino compound acid gas absorption promoters, one or more primary sterically hindered aminoacids represented by the formula:



wherein R_1 and R_2 are independently selected from CH_3, C_2H_5, and C_3H_7; R_3 and R_4 are independently selected from hydrogen and CH_3; and n is 0, 2 or 3; and

(b) desorbing at least a portion of the absorbed CO_2 from the solution.

4,919,905

PROCESS FOR THE SYSTEMATIC TREATMENT OF EXHAUST GASES

Mitsuhiro Horaguchi; Shigechika Tomizawa, and Yuji Kaihara, all of Yokohama, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 913,476, Sep. 30, 1986, abandoned. This application Aug. 9, 1988, Ser. No. 230,700
Claims priority, application Japan, Sep. 30, 1985, 60-214468
Int. Cl.[5] B01J 21/04; B01D 46/00, 53/04
U.S. Cl. 423—239 7 Claims

1. A systematic process for purifying and treating exhaust gases containing acidic gases and dust which comprises the steps of

providing a filtering dust collector inclusive of a bag filter pre-coated with an auxiliary agent which forms a protective coating on said filter;

injecting a neutralizing absorbent into an exhaust gas containing acidic gas components and dust so as to fix said acidic gas components therein;

further injecting an auxiliary agent of the nature of said coated auxiliary agent into said exhaust gas subsequent to the injection of said neutralizing absorbent;

passing said exhaust gas containing said neutralizing absorbent and said auxiliary agent, through said precoated dust collector filter such that said neutralizing absorbent and auxiliary agent are deposited as a layer on said precoated filter whereby said fixed acidic gas components and dust, which are present in said exhaust gas, are collected on said filter as said exhaust gas is passed through and emitted from said filter; and

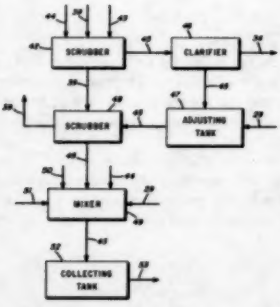
blowing ammonia into said filtered emission gas in the presence of a denitrating catalyst so that residual nitrogen oxides present in said filtered emission gas are reduced to nitrogen gas to produce a purified gas.

4,919,906

PROCESSES AND EQUIPMENT FOR PRODUCTION OF ELEMENTAL PHOSPHORUS AND THERMAL PHOSPHORIC ACID

James C. Barber, Florence, Ala., assignor to James C. Barber and Associates, Inc., Florence, Ala.

Filed Jun. 3, 1988, Ser. No. 201,747
Int. Cl.[5] C01B *25/01*
U.S. Cl. 423—323 **34 Claims**



1. A process for production of elemental phosphorus, said process comprised of the following steps:

(a) agglomerating phosphate ore by tumbling with binder formed by reacting acidic phosphorus compounds with alkaline substances;

(b) smelting agglomerated phosphate ore in step (a) with reducing carbon and silica in a submerged-arc electric furnace to generate a mixture of gases, said gas mixture containing carbon monoxide, hydrogen, and elemental phosphorus;

(c) cooling gases in step (b) by contacting said gases with water;

(d) collecting mixture of elemental phosphorus, phosphorus-containing solids, and water from step (c) in a sump;

(e) recycling water from step (d) to step (c);

(f) bleeding off a stream of water from step (e);

(g) removing phosphorus-containing solids from stream of water bled off in step (f);

(h) pumping mixture of elemental phosphorus and phosphorus-containing solids from said sump in step (d) to a tank having submerged pump in a well;

(i) pumping bottom layer to product storage;

(j) pumping phosphorus-containing solids from step (g) and step (i) to fluidizer;

(k) fluidizing mixture of phosphorus-containing solids in step (j);

(l) feeding fluidized mixture from step (k) to a burner;

(m) oxidizing mixture from step (l) to form phosphorus oxides;

(n) reacting phosphorus oxides in step (m) with water to form acidic phosphorus compounds; and

(o) pumping acidic phosphorus compounds in step (n) to step (a).

22. A process for upgrading phosphorus furnace feedstock, said process comprised of the following steps:

(a) mining phosphate ore;

(b) drying phosphate ore obtained in step (a);

(c) reacting acidic phosphorus compounds with alkaline substances to obtain a reaction product;

(d) drying reaction product prepared in step (c);

(e) mixing dried reaction product prepared in step (d) with phosphorus furnace feedstock; and

(f) smelting mixture prepared in step (e) in submerged arc electric furnace.

4,919,907

CRYSTALLINE GALLIOSILICATE WITH THE ZEOLITE L TYPE STRUCTURE

Mario L. Occelli, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 945,092, Dec. 22, 1986, abandoned. This application Nov. 22, 1988, Ser. No. 274,621
Int. Cl.[5] C01B *33/28*
U.S. Cl. 423—326 **18 Claims**

1. A crystalline, galliosilicate molecular sieve containing less than about 0.2 weight percent alumina having the following composition expressed in terms of oxide mole ratios in the anhydrous state:

$$Ga_2O_3{:}xSiO_2{:}yM_2O{:}zK_2O$$

where M is an alkali metal other than potassium, x equals at least 3.0, y equals 0 to 0.9, z equals 0.1 to 1.0 and y+z equals about 1.0, said crystalline galliosilicate molecular sieve having an X-ray powder diffraction pattern comprising at least the d-spacings set forth in Table 1.

4,919,908

CRYSTALLINE ALUMINOSILICATE AND A METHOD FOR ITS PREPARATION

Niels J. Blom, Hillerod, Denmark, assignor to Haldor Topsoe A/S, Denmark

Continuation of Ser. No. 102,141, Sep. 22, 1987, abandoned. This application Apr. 20, 1989, Ser. No. 341,231
Claims priority, application Denmark, Jan. 24, 1986, 374/86
Int. Cl.[5] B29C *53/00*
U.S. Cl. 423—328 **13 Claims**

1. A synthetic layered crystalline aluminosilicate comprising, when disregarding the presence of crystal water, the general formula expressed as moles of oxides ratios:

$$(M_{2/n}O)_x{\cdot}(SiO_2)_y{\cdot}(Al_2O_3)_z$$

where M represents one or more n-valent cations selected from the group consisting of sodium, potassium, and any other cation capable of replacing sodium or potassium by ion-exchange, where the ratio y/z is between 15 and 300, where the ratio x/z is determined from the criterion of electron neutrality between anions and cations, and in which the structural aluminum is tetrahedrally coordinated in the crystalline framework, and where the aluminosilicate has an X-ray diffraction pattern which exhibits a sharp diffraction maximum at about 3.45 Å and a further diffraction maximum at about 3.65 Å, the inten-

sity of the further diffraction maximum being not more than 80% of the first diffraction maximum.

4,919,909

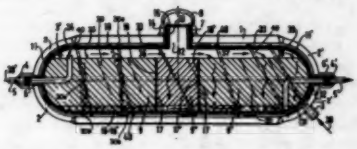
REACTOR FOR CATALYTIC SYNTHESIS AND PROCESS FOR USING THE REACTOR

Pierre Lesur, Paris; Christian Faury, Vanves; Guy Lafleur, Les Essarts, and André Papillon, Saint-Maur-Des-Fosses, all of France, assignors to Societe Chimique de la Grande Paroisse, Paris, France

Continuation of Ser. No. 804,505, Dec. 4, 1985, abandoned. This application Jan. 7, 1988, Ser. No. 145,631

Int. Cl.[5] C01C *1/04*; B01J *8/02*

U.S. Cl. 423—360 **21 Claims**



1. A reactor for catalytic synthesis under pressure comprising:

an outer shell capable of being pressurized including a cylindrical wall with a main horizontal axis and having two hemispherical ends, and an inner shell concentric with said outer shell, defining an enclosed space for holding a catalyst;

a single layer catalyst concentric with said inner shell and within said enclosed space, an external surface of said inner shell being covered with and supported by compression resistant insulation in contact therewith, a space being located between an internal surface of said outer shell and the covered external surface of the inner shell, protective perforated ring supports concentric with said inner shell enclosing said inner shell and supporting said insulation, said protective perforated ring supports having openings for the passage therethrough of gases, and a helical baffle wrapped about said inner shell, and extending from one end of said inner shell to the other, defining a generally horizontally disposed helical flow path for gases between said inner and outer shells, said helical flow path including said openings in said perforated ring supports;

the outer shell and the inner shell being provided with means for introducing and withdrawing gas streams into said inner shell, located at the ends of the main horizontal axis of the reactor and facing each other on the hemispherical ends;

the inner shell being connected to a vertical pipe for filling and emptying the catalyst.

9. In a process for synthesizing a gas selected from the group consisting of ammonia and methanol in a catalytic reactor by passing reactive pressure gases through said reactor, the improvement comprising the steps of;

providing a reactor comprising a shell capable of being pressurized including a cylindrical wall with a main horizontal axis and having two hemispherical ends, and an inner shell concentric with said outer shell defining an enclosed space for holding a catalyst; a single catalyst concentric with said inner shell and within said enclosed space, an external surface of said inner shell being covered with and supported by compression resistant insulation in contact therewith, a space being located between an internal surface of said outer shell and the covered surface of the inner shell, protective ring supports concentric with said inner shell enclosing said inner shell and supporting said insulation, said protective ring supports having openings extending therethrough for the passage of gases, therethrough and a helical baffle wrapped about said inner shell and extending from one end of said inner shell to the other, defining a generally horizontally disposed helical flow path for gases between said inner and outer shells, said flow path including said openings of said ring supports; and

passing a protective gas along said generally horizontally disposed helical flow path and through said opening in said support rings to prevent overheating of said outer shell.

4,919,910

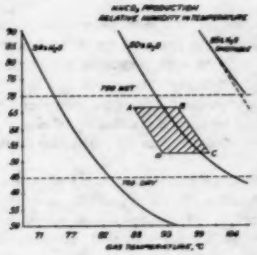
PROCESS FOR THE PRODUCTION OF POTASSIUM BICARBONATE

Andrew D. Kurtz, Somerville, and Anthony E. Winston, East Brunswick, both of N.J., assignors to Church & Dwight Co., Inc., Princeton, N.J.

Filed Aug. 17, 1988, Ser. No. 233,330

Int. Cl.[5] C01D *7/10*

U.S. Cl. 423—422 **7 Claims**



1. A process for the production of substantially dry potassium bicarbonate, which process comprises feeding dry potassium carbonate into admixture with carbon dioxide gas and water vapor at rates so that the reaction zone has temperatures of from 70° to 110° C. and relative humidities of from 40% to 75% and reacting the potassium carbonate, carbon dioxide, and water vapor at atmospheric pressure, under turbulent mixing conditions, and in the substantial absence of liquid water to produce substantially dry bicarbonate product without the need for a separate drying step.

4,919,911

METHOD OF RECOVERING A LITHIUM CHLORIDE

Daigo Shirota; Masao Omori, both of Ichihara; Hiroyasu Yamato, and Norio Ogata, both of Sodegaura, all of Japan, assignors to Idemitsu Petrochemical Company Limited, Tokyo, Japan

Filed Dec. 16, 1988, Ser. No. 285,031

Claims priority, application Japan, Dec. 19, 1987, 62-322494; Nov. 1, 1988, 63-276745

Int. Cl.[5] C01D *3/04*; C08G *75/16*

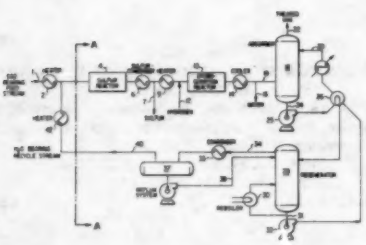
U.S. Cl. 423—499 **10 Claims**

1. A method of recovering lithium chloride, comprising reacting a dihalogenated aromatic compound and an alkali metal sulfide and/or alkali metal hydrogen sulfide in a polar solvent in the presence of lithium chloride, separating a solvent insoluble component from the resultant reaction mixture to obtain a solution and calcinating a residue obtained by removing volatile substances from the solution.

4,919,912
PROCESS FOR THE TREATMENT OF SULFUR CONTAINING GASES

George W. Taggart, Dallas; Lawrence T. Denk, Garland, and J. Michael Lawrence, Plano, all of Tex., assignors to Ford, Bacon & Davis Incorporated, Richardson, Tex.

Filed Oct. 18, 1985, Ser. No. 788,818
Int. Cl.[5] C01B *17/04*
U.S. Cl. 423—574 R 32 Claims



1. In the treatment of a feed gas stream containing sulfur dioxide in an amount in excess of the stoichiometric equivalent for the Claus reaction with hydrogen sulfide to produce elemental sulfur, the process comprising:

(a) passing said sulfur dioxide containing feed gas stream to a reaction zone for the production of elemental sulfur by the Claus reaction and an off-gas stream containing sulfur dioxide;

(b) passing said off-gas stream to a hydrogenation zone in which the sulfur dioxide in said off-gas stream is hydrogenated to produce hydrogen sulfide which is contained in an effluent gas stream from said hydrogenation zone;

(c) passing the effluent gas stream from said hydrogenation zone to a hydrolysis zone and within said hydrolysis zone hydrolyzing reduced sulfur values in said effluent stream to produce hydrogen sulfide;

(d) extracting hydrogen sulfide from said effluent gas to produce a hydrogen sulfide containing recycle stream which is distinct from said feed gas stream;

(e) passing said extracted hydrogen sulfide in said recycle stream to said reaction zone in addition to said feed gas stream; and

(f) concomitantly with step (e) continuing to pass said feed gas stream to said reaction zone, said feed gas stream continuing to contain sulfur dioxide in an amount in excess of the stoichiometric equivalent for the Claus reaction.

4,919,913
PROCESS FOR THE PRODUCTION OF SOLAR SILICON

Günter Kurz, Duesseldorf; Martin Abels, Krefeld; Ingo Schwirtlich, Krefeld, and Peter Woditsch, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Jul. 3, 1989, Ser. No. 375,281
Claims priority, application Fed. Rep. of Germany, Jul. 15, 1988, 3824065
Int. Cl.[5] C01B *33/02*; C01F *3/00*
U.S. Cl. 423—348 9 Claims

1. In an improved process for the production of silicon by reacting aluminum with gaseous silicon compounds having the formula

$$SiH_nX_{4-n}$$

where X is halogen and n is a value from 0 to 3, the improvement comprising intensively contacting the molten surface of dispersed particles of pure aluminum or an Al-Si alloy with the gaseous silicon compound during the reaction.

4,919,914
REMOVAL OF HYDROGEN SULPHIDE FROM GASEOUS STREAMS

James W. Smith, Toronto; Robert A. Barton, Downsview, both of Canada, and Cyril H. Knight, deceased, late of Kleinburg, Canada (by Leslie James), assignors to 780863 Ontario Limited, Toronto, Canada

Continuation-in-part of Ser. No. 11,425, Feb. 3, 1987, abandoned, which is a continuation of Ser. No. 867,631, May 27, 1986, abandoned, which is a continuation of Ser. No. 573,389, Jan. 24, 1984, abandoned. This application Jul. 14, 1988, Ser. No. 218,924
Claims priority, application United Kingdom, Jan. 25, 1983, 8301968
Int. Cl.[5] B01D *53/36*; C01B *17/05, 17/10*
U.S. Cl. 423—576.2 10 Claims

1. A process for the removal of hydrogen sulphide from a hydrogen sulpide-containing gas stream which comprises:

continuously feeding the hydrogen sulphide-containing gas stream to a reaction zone in an agitated flotation cell containing an aqueous medium and a hydrogen sulphide-oxidizing catalyst which is chelated ferric hydroxide dissolved in the aqueous medium, said aqueous medium having a pH of about 7 to about 11.5 and a temperature of about 10° to about 80° C.,

continuously feeding an oxygen-containing gas stream to said reaction zone in said agitated flotation cell at a rate to provide at least sufficient oxygen to effect complete oxidation of the hydrogen sulphide in said hydrogen sulphide-containing gas stream to sulphur,

continuously distributing said gas streams in the aqueous medium at substantially the same submerged location as fine bubbles and permitting the bubbles to rise from said submerged location towards the upper surface of the aqueous medium while intimate contact between the hydrogen sulphide, catalyst and oxygen in the aqueous medium is achieved, so as to cause rapid catalytic oxidation of hydrogen sulphide during a residence time of less than about 2 seconds in the aqueous medium to form fine sulphur particles and formation of bubbles of hydrogen sulphide-depleted gas stream,

continuously transporting the fine sulphur particles to the upper surface of the aqueous medium by the rising of said bubbles of hydrogen sulphide-depleted gas stream so as to collect the fine sulphur particles on the surface of the aqueous medium, whereby the operations of hydrogen sulphide oxidation to sulphur and recovery of the sulphur so produced are both effected continuously in a single aqueous reaction medium contained in said agitated flotation cell from the hydrogen sulphide-containing gas stream and the oxygen-containing gas stream fed thereto, and

removing sulphur from the upper surface of the aqueous

4,919,915
METHOD FOR DETECTING THE ABILITY TO PREVENT RED-TO-GREEN CONGOPHILIC BIREFRINGENCE

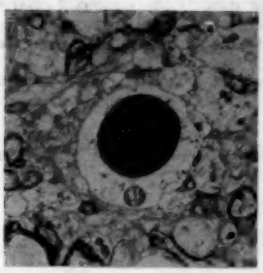
Paul Averback, 180, 4e Rang, St. Liguori, Quebec, Canada (J0K 2X0)

Continuation-in-part of Ser. No. 21,242, Mar. 3, 1987, Pat. No. 4,816,416, which is a continuation-in-part of Ser. No. 901,007, Aug. 27, 1986, abandoned. This application Feb. 27, 1989, Ser. No. 315,796
Int. Cl.[5] G01N *21/78*
U.S. Cl. 424—7.1 13 Claims

1. A method for detecting the ability of a compound to prevent red-to-green congophilic birefringence as a possible

indication of the compound's ability to impede amyloid formation comprising the steps of

(i) contacting a compound with a reagent in a first sample, wherein the reagent consists essentially of dense microspheres which are derived from mammalian brain tissue and which, when disrupted, display red-to-green congophilic birefringence upon standing with Congo Red dye,



under conditions such that said dense microspheres are disrupted in said first sample; thereafter

(ii) staining a test material selected from the group consisting of the first sample or a portion thereof which contains at least some of the disrupted dense microspheres with Congo Red dye; and

(iii) detecting any development of red-to-green congophilic birefringence in the stained test material.

4,919,916

TREATMENT OF NEUROTRANSMITTER-LINKED DRUG ABUSE

Daniel H. Golwyn, 701 E. Semoran Blvd., Altamonte Springs, Fla. 32715

Continuation-in-part of Ser. No. 88,830, Aug. 24, 1987, Pat. No. 4,786,653. This application Nov. 21, 1988, Ser. No. 273,777

The portion of the term of this patent subsequent to Nov. 22, 2005, has been disclaimed.

Int. Cl.[5] A61K *27/00*

U.S. Cl. 424—10 **5 Claims**

1. A method of treating abusers of a drug likely to enhance neurotransmitter activity in the short term and to depress such activity over a longer term, comprising administering to them substantially daily an effective amount of a pharmaceutical composition comprising a phenylalkylhydrazine, for a minimum period of about several weeks to about a half dozen weeks.

4,919,917

AGENT FOR REDUCING NEPHROTOXICITY CAUSED BY CYCLOSPORIN ADMINISTRATION

Norihiro Kakimoto, Machida; Kazuo Kumano, Yamato, and Kunie Nakamura, Sagamihara, all of Japan, assignors to Asai Germanium Research Institute Co., Ltd., Tokyo, Japan

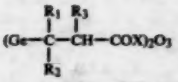
Filed Oct. 24, 1988, Ser. No. 261,406

Claims priority, application Japan, Oct. 29, 1987, 62-273746

Int. Cl.[5] A61K *31/28*

U.S. Cl. 424—10 **6 Claims**

1. A method for reducing the nephrotoxicity caused by cyclosporin adminstration, said method comprising administering to a mammalian organism in need of such treatment, an effective amount to reduce nephrotoxicity caused by cyclosporin administration of an organogermanium compound represented by the formula (I)



(I)

wherein R_1 to R_3 are each a hydrogen atom or a lower alkyl group which may be the same or different, or a phenyl group, and X is a hydroxyl group, a lower alkoxy group, an $—NH_2$ group of O^-Y^+ where Y is selected from the group consisting of a metal, lysozyme and a basic amino acid.

4,919,918

NON-ALCOHOLIC MOUTHWASH

B. Harrison Cole; Donald C. Kroeger, and Mark E. Wilson, all of Houston, Tex., assignors to Spectrum Consumer Products Co., Inc., Houston, Tex.

Filed Mar. 14, 1988, Ser. No. 167,504

Int. Cl.[5] A61K *9/16, 9/18, 9/46*

U.S. Cl. 424—44 **8 Claims**

1. A dry non-alcoholic mouthwash compound in tablet or in dry granular form adapted to be dissolved in water for cleaning and disinfecting an individual's mouth, teeth, gums and breath, comprising:

(a) at least one solid, pharmaceutically acceptable acid and at least one solid, pharmaceutically acceptable base, which are adapted to react to produce carbon dioxide when dissolved in water causing effervescence;

(b) about 38% by weight of at least one additive consisting of a volatile oil in spray-dried form for use as a flavoring agent;

(c) an effective amount of one or more of the following surface acting agents selected from a group consisting essentially of sodium laurylsulfate, sodium n-laurylsarcosinate, sodium alkylsulfoacetate, sulfocolaurate, sulfated monoglyceride, and sodium monoglyceride, the surface acting agent acting as a solvent in water to reduce surface tension between the additive and the water, to disperse the flavoring agent, and to render the use of alcohol in the mouthwash unnecessary.

4,919,919

NITROGLYCERIN SPRAY

Yukio Aouda, Tokyo; Hiroshi Ninomiya, Sayama; Genichi Izu, Saitama; Yuichi Yazawa, and Megumi Tachibana, both of Tokyo, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 14, 1988, Ser. No. 244,487

Claims priority, application Japan, Sep. 30, 1987, 62-244259

Int. Cl.[5] A61K *9/08, 9/12, 9/72, 31/21*

U.S. Cl. 424—45 **2 Claims**

1. A nitroglycerin spray prepared by filling a solution having a pH of about 3.0 to about 6.0 and consisting essentially of the following components (a), (b) and (c) and substantially free from other components:

(a) about 0.5 to about 1 w/v %, based on the whole solution, of nitroglycerin,

(b) about 50 to about 70 v/v %, based on the whole solution, of ethanol, and

(c) the balance of water, into a container.

4,919,920

METHOD OF HARDENING AND STRENGTHENING KERATIN AND COMPOSITION

John B. Devos, 117 Lake St., Libertyville, Ill. 60048

Filed Mar. 15, 1989, Ser. No. 323,974

Int. Cl.[5] A61K *7/04, 33/16*

U.S. Cl. 424—61 **35 Claims**

10. An aqueous composition for hardening and strengthening a keratinized appendage of a mammal comprising a cosmetically-acceptable aqueous vehicle having dissolved therein

a physiologically tolerable keratin hardening and strengthening agent including an effective amount of fluoride ion, the composition having a pH of about 3.5 to about 8.

4,919,921

COMPOSITIONS FOR TOPICAL USE HAVING MELANIN SYNTHESIS-INHIBITING ACTIVITY

Shinkichi Hatae, Onojo, Japan, assignor to Sansho Seiyaku Co., Ltd., Onojo, Japan

Filed Sep. 23, 1988, Ser. No. 248,684
Claims priority, application Japan, Sep. 25, 1987, 62-241965
Int. Cl.[5] A61K *7/48*
U.S. Cl. 424—62 5 Claims

1. A composition for topical use which has a melanin synthesis-inhibiting activity, comprising kojic acid or an ester of kojic acid and vitamin C or or a derivative of vitamin C.

4,919,922

POLYOLEFIN-TREATED PIGMENT AND COSMETICS CONTAINING THE SAME

Ryota Miyoshi, Yono; Isao Imai, Kuki, and Tadashi Sugaya, Iwatsuki, all of Japan, assignors to Miyoshi Kasei Co. Ltd., Urawa, Japan

Continuation of Ser. No. 146,670, Jan. 21, 1988, abandoned. This application Aug. 21, 1989, Ser. No. 396,822
Claims priority, application Japan, Jan. 21, 1987, 62-012044
Int. Cl.[5] A61K *7/021, 31/74;* C08K *9/00;* C08J *39/00*
U.S. Cl. 424—63 4 Claims

1. A surface-treated pigment having excellent spreadability and feeling, said pigment consisting essentially of pigment particles, wherein the surfaces of the pigment particles are coated with a coating consisting essentially of a polyolefin which contains —COOR groups, wherein R is a metal atom selected from the group consisting of Al, Mg, Ca, Zn, Zr and Ti, said polyolefin containing —COOR groups having a molecular weight in the range from 500 to 20,000, and an acid value in the range from 5 to 100, the amount of said polyolefin containing —COOR groups being in the range from 0.5 to 10% by weight based on the weight of pigment.

4,919,923

COSMETIC EMULSIONS HAVING IMPROVED FLOW BEHAVIOR

Horst Hoeffkes, Duesseldorf; Fritz Lange, Essen, and Achim Assmann, Hilden, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 112,798, Oct. 23, 1987. This application Jan. 5, 1989, Ser. No. 293,733
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1986, 3636256
Int. Cl.[5] A61K *7/06, 7/09, 7/48*
U.S. Cl. 424—70 18 Claims

1. An oil in water cosmetic emulsion comprising about 70 to about 99% by weight of aqueous phase and between about 0.5 and about 5.0% by weight, based on the total composition, of at least one dialkyl ether of the formula R^1—O—R^2, wherein R^1 and R^2 each are, independently, a linear or single-branch C_{6-22} alkyl.

4,919,924

USE OF THIOREDOXIN, THIOREDOXIN-DERIVED, OR THIOREDOXIN-LIKE DITHIOL PEPTIDES IN HAIR CARE PREPARATIONS

Vincent P. Pigiet, Winchester, Mass., assignor to Repligen Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 674,893, Nov. 26, 1984, abandoned. This application Aug. 28, 1985, Ser. No. 770,498
Int. Cl.[5] A61K *7/09*
U.S. Cl. 424—72 9 Claims

1. A composition of matter for waving, or straightening human hair which comprises a thioglycolic acid compound at a concentration of about 0.01M to about 0.2M, and thioredoxin or a thioredoxin-derived, or thioredoxin-like, dithiol peptide at a concentration of about 1 nmole/ml to about 100 nmole/ml.

4,919,925

DEODORANT, DEODORIZING COMPOSITE MATERIAL, DEODORIZING RESIN COMPOSITION, DEODORIZING RESIN ARTICLES AND DEODORIZING FOAM

Tsunehisa Ueda; Kouji Miyazaki, both of Kawasaki, and Tadao Natsuume, Yokosuka, all of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Jul. 13, 1988, Ser. No. 218,551
Claims priority, application Japan, Jul. 17, 1987, 62-178663; Sep. 11, 1987, 62-228052
Int. Cl.[5] A61L *2/16*
U.S. Cl. 424—76.1 4 Claims

1. A method for deodorizing malodorous components which comprises exposing the malodorous components or the atmosphere in which said malodorous components are present to a deodorant effective amount of an adduct of an alpha,beta-unsaturated dicarboxylic acid anhydride and an olefin or a derivative of said adduct as a deodorant active ingredient, said adduct being a Diels-Alder reaction product of an alpha,beta-unsaturated dicarboxylic acid anhydride and a diolefin hydrocarbon or an ene reaction product of an alpha,beta-unsaturated dicarboxylic acid anhydride and an olefinic hydrocarbon.

4,919,926

INSECT ATTRACTION PREVENTER

Yosuke Watanabe, Chiba; Yuji Kawakami, Kodaira; Koichiro Kikuchi, Tokorozawa; Yoshiyuki Ogawa, Chiba, and Hiroshi Sato, Funabashi, all of Japan, assignors to Ikari Corporation and Taisei Kako Co., Ltd., both of Tokyo, Japan

Filed Nov. 23, 1987, Ser. No. 124,082
Claims priority, application Japan, Nov. 27, 1986, 61-280873
Int. Cl.[5] A61K *31/78, 31/74;* F21V *19/00;* B32B *17/10*
U.S. Cl. 424—81 10 Claims

1. A method for preventing insect attraction, said method comprising

preventing attraction of insects to a light source by locating a transparent synthetic resin which contains a light shielding agent therein absorbing light in the range from 200 to 500 nm wavelength relative to the light source so that the light transmitted by the light sources passes through said synthetic resin and light having a wavelength of 200 to 500 nm is prevented from passing through said transparent synthetic resin by said light shielding agent thereby preventing the attraction of insects towards the light source.

4,919,927

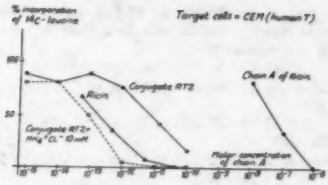
PROCESS FOR THE POTENTIATION OF IMMUNOTOXINS

Pierre Casellas; Pierre Gros, both of Montpellier, and Franz Jansen, St Mathieu de Treviers, all of France, assignors to Sanofi, Paris, France

Continuation-in-part of Ser. No. 438,037, Nov. 1, 1982, Pat. No. 4,643,895. This application Aug. 31, 1988, Ser. No. 239,071
Claims priority, application France, Nov. 20, 1981, 81 21836
The portion of the term of this patent subsequent to Feb. 17, 2004, has been disclaimed.
Int. Cl.[5] A61K *39/395*
U.S. Cl. 424—85.91 1 Claim

1. In a process for preparing a composition comprising a conjugate of the chain A of ricin coupled by means of a disul-

fide bridge with an antibody directed against human T cells, the improvement comprises adding to said conjugate an amount of ammonium chloride effective to increase the cytotoxic activity of said conjugate.



4,919,928

CONJUGATES IN WHICH A MONOVALENT CARBOXYLIC IONOPHORE IS ASSOCIATED BY MEANS OF A COVALENT BOND WITH A MACROMOLECULE, THEIR USE AS IMMUNOTOXIN POTENTIATORS AND THE INTERMEDIATE ACTIVATED IONOPHORES

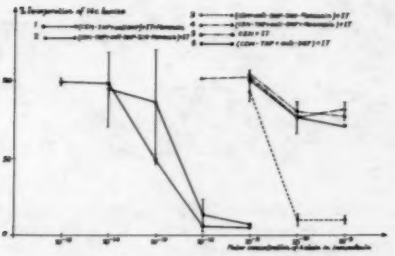
Franz Jansen, Castries, and Pierre Gros, Montpellier, both of France, assignors to Sanofi, Paris, France

Continuation of Ser. No. 733,660, May 13, 1985, abandoned. This application Apr. 6, 1987, Ser. No. 34,712

Claims priority, application France, May 23, 1984, 84 08073; Jul. 13, 1984, 84 11208

Int. Cl.[5] A61K *39/395, 39/39, 37/00*

U.S. Cl. 424—85.91 27 Claims



1. A conjugated which is an in vivo potentiator for immunotoxins and which comprises a monovalent carboxylic ionophore coupled by means of a covalent bond to a macromolecule.

4,919,929

MAMMAL IMMUNIZATION

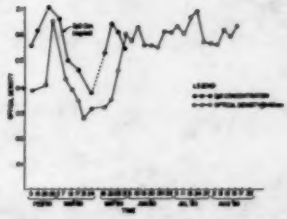
Lee R. Beck, Birmingham, Ala., assignor to Stolle Research & Development Corporation, Birmingham, Ala.

Continuation of Ser. No. 576,001, Feb. 1, 1984, abandoned. This application Sep. 17, 1986, Ser. No. 910,297

Int. Cl.[5] A61K *39/00*

U.S. Cl. 424—88 14 Claims

1. A method for providing milk having an elevated IgG antibody level comprising implanting intramuscularly or subcutaneously within a bovid mammal an antigenic substance in an amount effective to elicit a hyperimmunization response, said antigenic substance being incorporated within shaped microparticles of a biocompatible matrix material which causes controlled release of said antigen, thereby prolonging antigenic activity within said bovid mammal, and recovering milk having an elevated, higher than normal level of IgG antibody.



4,919,930

SYNTHETIC M PROTEINS-STREPTOCOCCI TYPE 5

Edwin H. Beachey, and James B. Dale, both of Memphis, Tenn., assignors to University of Tennessee Research Corporation, Knoxville, Tenn.

Continuation-in-part of Ser. No. 739,963, May 31, 1985, abandoned, and a continuation-in-part of Ser. No. 700,625, Feb. 12, 1985, Pat. No. 4,597,967, which is a division of Ser. No. 503,273, Jun. 10, 1983, Pat. No. 4,521,334. This application May 1, 1986, Ser. No. 858,436

Int. Cl.[5] A61K *39/09, 37/02;* C07K *7/08, 7/10*

U.S. Cl. 424—88 28 Claims

1. A synthetic polypeptide which elicits opsonobactericidal antibodies against pep M5 and which is not serologically cross-reactive with tissue antigens of the heart, which polypeptide has the amino acid sequence

X-Glu-Ala-Leu-Asp-Lys-Tyr-Glu-Leu-Glu-Asn-His-Y

wherein

X is Lys- or A-Val-Thr-B-Gly-Thr-Ile-C-Asp-Pro-Gln-D-Ala-Lys wherein

A is Ala or Thr,

B is Lys or Arg,

C is Asn or Ser, and

D is Ala or Arg; and

wherein

Y is

-Asp,

-Asp-Cys or

-Asp-Leu-Lys-Thr-E-Asn-Glu-Gly-Leu-Lys

wherein E is Asn or Lys.

4,919,931

METHOD FOR PRODUCING OSSEIN HYDROXYAPATITE COMPOUND

Thea Rosenberg née Göldner, Basel, Switzerland, assignor to Robapharm AG, Switzerland

Filed Feb. 5, 1987, Ser. No. 11,504

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1986, 3626414

Int. Cl.[5] A61K *35/32, 37/02*

U.S. Cl. 424—95 5 Claims

1. A method for producing an ossein hydroxyapatite compound comprising the steps of:

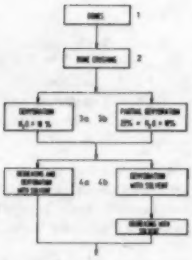
(a) crushing the bones of a mammal aged from prenatal to approximately 12 months old to produce bone particles of about 1 cm in size;

(b) acidifying said bone particles of step (a) to pH 5.0 to 5.5 with an acid;

(c) dehydrating and degreasing said acidified bone particles

with a hydrophilic and lipophilic solvent to a residual water and residual fat content of about 5%;

(d) drying said dehydrated and degreased bone particles at reduced pressure at 20° to 80° C. to a solvent content of about 1%;



(e) pulverizing said bone particles to a particle size of about 50 to 300 micrometers; and

(f) sterilizing said bone particles such that an ossein hydroxyapatite compound is produced,

wherein said compound has the following dry substance analytical characteristics:

Organoleptic Test	Fine to slightly granular, beige-gray powder with faint natural odor
Identity	Calcium and phosphatase identified Collagen identified
Water Content	<7%
Total ash	51.3–62.7%
Calcium	19.2–23.6%
Phosphorus	8.9–10.9%
Collagen	23.4–28.6%
Non-collagenic Proteins/ Peptides	7.2–10.8%
Trace Elements	F, Na, K, Mg, Fe, Zn, Cu and Ni identified
Phosphatase Activity	0.5–15 mE/mg
Anomalous Toxicity	No signs of intolerance
Total Microbial Content	$<10^4$/g
Yeasts	$<10^2$/g
Enterobacteriaceae	$<10^2$/g
Specific Microbe Species	Absent/g

and said compound is characterized by the following biological activities:

(i) stimulation of DNA synthesis in osteoblasts, chondrocytes, and fibroblasts,

(ii) stimulation of protein synthesis in chondrocytes and fibroblasts,

(iii) selective stimulation in chondrocytes of collagen synthesis, as a fraction of total protein synthesis,

(iv) induction of the synthesis of proteins x and y in chondrocytes, and

(v) promotion of differentiation of non-specific mesenchymal cells to chondrocytes or osteoblasts.

4,919,932

PHARMACEUTICAL FORMULATION FOR THE TREATMENT OF BACTERIAL INFECTIONS

Michael Limbert, Taunus; Elmar Schrinner, Wiesbaden, and Gerhard Seibert, Darmstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 2, 1987, Ser. No. 56,712

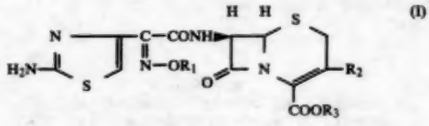
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1986, 3618813

Int. Cl.[5] **A61K** *35/00, 31/345, 31/395*

U.S. Cl. 424—114 **2 Claims**

1. A pharmaceutical formulation having a synergistic antibacterial activity, comprising

(a) a cephalosporin derivative of the formula I

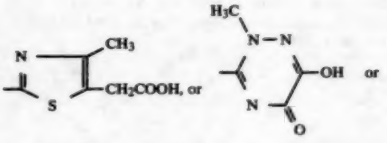


(I)

in which

R_1 can be C_1–C_4-alkyl and the $=N—OR_1$ group is in the synposition,

R_2 can have the meaning of acetoxymethyl, of $—CH_2S—X$, with x=



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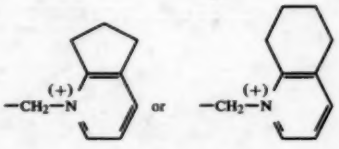
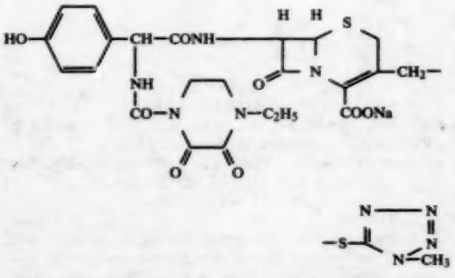


and

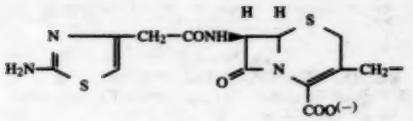
R_3 is hydrogen, a physiologically acceptable cation, a physiologically acceptable ester radical or, if the structure $—CH_2—(^{+})$ appears in R_2, can represent a negative charge, or

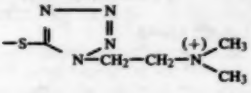
(b) a cephalosporin derivative of the formula



or

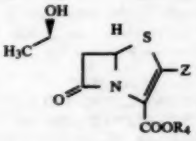
(c) a cephalosporin derivative of the formula





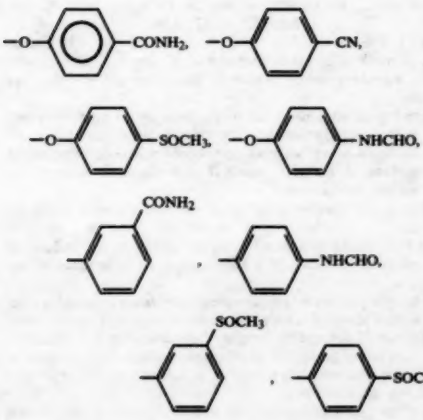
and

(d) a penem antibiotic of the formula II



II

in which Z can be



—CH_2—O—$CONH_2$, —S—$(CH_2)_2$—O—$CONH_2$ or —S—$(CH_2)_3$—SO_2NH_2 and

R_4 can be a physiologically acceptable cation or a physiologically acceptable ester radical, and wherein the ratio of cephalosporin to penem antibiotic is between 1:9 and 9:1.

4,919,933

METHOD FOR THE TREATMENT OF DENTAL DISEASE

Hae-chul Park; Young-cha Choi; Kyung-dong Park; Mi-ae Park, and Kyu-dong Park, all of 144-16, Wooam-dong, Chungju-si, Choongbuk-do, Rep. of Korea

Filed Nov. 10, 1988, Ser. No. 269,591

Int. Cl.[5] A61K *32/20, 35/04*

U.S. Cl. 424—196.1 **3 Claims**

1. A method of preventing inflammation and pain associated with dental disease in the oral cavity of a patient not suffering from disease in the oral cavity which exhibits inflammation and pain by topically applying to the teeth and associated areas within the oral cavity which may exhibit inflammation and pain an effective amount of a composition consisting essentially of pine resin and table salt in a ratio of about 1:1 to 5 parts by weight, respectively, and which is prepared by mixing pine resin and table salt in the ratio mentioned above, heating the above mixture while stirring, cooling the mixture to room temperature, and grinding the resulting solid to a powder form.

4,919,934

COSMETIC STICKS

George E. Deckner, Trumbull, and Rupali A. Kulkarni, Huntington, both of Conn., assignors to Richardson-Vicks Inc., Shelton, Conn.

Filed Mar. 2, 1989, Ser. No. 317,773

Int. Cl.[5] A61K *7/00, 7/32, 7/42, 7/44*

U.S. Cl. 424—401 **10 Claims**

1. A cosmetic stick composition comprising:

(a) from about 10% to about 50% of a wax-type solidifying agent selected from the group consisting of beeswax, spermaceti, carnauba, baysberry, candelilla, montan, ozokerite, ceresin, paraffin, hydrogenated castor oil, Fisher-Tropsch waxes, microcrystalline waxes, ethylene glycol diesters, triglyceride waxes and ethylene/vinyl acetate copolymers, and mixtures thereof;

(b) from about 5% to about 90% of one or more of a polyalphaolefin of the formula:

$$R_1—C{=}C—R_2$$

wherein R_1 and R_2 are independently C_{20} to C_{70} alkyl and wherein said polyalphaolefin has an average molecular weight of from about 300 to about 800 daltons and a viscosity of from about 2 to about 10 centistokes at 100° C.;

(c) from about 1% to about 40% of an active component selected from the group consisting of sunscreens, analgesics, moisturizers, antiperspirants and deodorants and mixtures thereof;

(d) from about 10% to about 50% of an emollient; and

(e) from about 0.01 to about 15% of an emulsifier.

4,919,935

INSECTICIDAL COMPOSITIONS

Silvia Dorn, Dielsdorf, Switzerland, assignor to R. Maag AG, Dielsdorf, Switzerland

Filed Sep. 15, 1988, Ser. No. 245,691

Claims priority, application Switzerland, Sep. 30, 1987, 3810/87

Int. Cl.[5] R01N *25/00*

U.S. Cl. 424—405 **7 Claims**

1. An insecticidal composition wherein the insecticidally active substances consist essentially of:

(a) ethyl[2-(4-phenoxyphenoxy)ethyl]carbamate and

(b) 2,3-isopropylidenedioxyphenyl methylcarbamate or 2-isopropoxyphenyl methylcarbamate or 2-(1,3-dioxolane-2-yl)phenyl methylcarbamate and, optionally, inert carrier material, and the weight ratio of component (a) to component (b) lies in the range of about 10:0.01 to 1:10.

4,919,936

FEEDS

Takefumi Iwanami, Kanagawa; Kiyoshi Maruta, Tokyo; Ichiya Murota, Kanagawa, and Hiroshi Miyazaki, Tokyo, all of Japan, assignors to The Calpis Food Industry Co., Ltd., Tokyo, Japan

Filed May 1, 1987, Ser. No. 44,477

Claims priority, application Japan, Feb. 25, 1987, 62-40097

Int. Cl.[5] A23K *1/17*; C12R *1/07*

U.S. Cl. 424—442 **2 Claims**

1. A method for increasing the weight gain in animals comprising feeding to said animals a food which is supplemented with an amount effective to increase the weight of a probiotic comprising a carrier and *Bacillus subtilis* C-3102 (FERM BP-1096).

2. A method for increasing the weight of eggs comprising

feeding to laying hens a food which is supplemented with an effective amount to increase the weight of said eggs of a probiotic comprising a carrier and *Bacillus subtilis* C-3102 (FERM BP-1096).

4,919,937

PERCUTANEOUS ADMINISTRATION OF TAMOXIFEN

Pierre Mauvais-Jarvis, 12, Parc de Bearu, F-92210 Saint Cloud, and Frédérique Kuttenn, 6, Avenue des Gobelins, F-75008 Paris, both of France

PCT No. PCT/EP84/00436, § 371 Date Sep. 13, 1985, § 102(e) Date Sep. 13, 1985, PCT Pub. No. WO85/03228, PCT Pub. Date Aug. 1, 1985

PCT Filed Dec. 21, 1984, Ser. No. 777,786

Claims priority, application France, Jan. 20, 1984, 84 00927

Int. Cl.[5] A01N *33/02*; A61K *31/135*

U.S. Cl. 424—449 **2 Claims**

1. A method of treating conditions of the breast including the steps of:

forming an aqueous alcoholic gel in which the active ingredient consists of

1-[4-(2-N-dimethylaminoethoxy)phenyl]-1-(4-hydroxyphenyl)-2-phenylbut-1-(Z)-ene; and

administering percutaneously said aqueous alcoholic gel as an anti-estrogen drug to a breast.

4,919,938

SUSTAINED RELEASE PHARMACEUTICAL COMPOSITIONS IN ORAL DOSAGE FORM

Claire J. Lovegrove, Ware; David A. Rawlins, Tewin; Anthony J. Phillips, Little Hadham, and David A. Tainsh, Buntingford, all of England, assignors to Merck Sharp & Dohme Ltd., Hoddesdon, England

Continuation of Ser. No. 68,986, Jul. 1, 1987, abandoned. This application Oct. 4, 1989, Ser. No. 418,821

Claims priority, application United Kingdom, Jul. 9, 1986, 8616669

Int. Cl.[5] A61K *9/36, 9/16*

U.S. Cl. 424—480 **3 Claims**

1. A sustained release pharmaceutical composition in tablet form consisting essentially of:

(1) a core matrix containing 20% to 60% w/w of a hydroxypropylmethylcellulose gelling agent, the remainder of the core matrix containing 0.41% to 20% w/w of (+)-trans-1a,2,3,4a,5,6-hexahydro-9-hydroxy-4-(1-propyl)-4H-naphth[1,2-b]-1,4-oxazine hydrochloride and 2.08 to 12.5% w/w of buffering agent homogeneously dispersed therein, plus suitable pharmaceutically acceptable excipients; and

(2) A coating layer surrounding the core matrix, the coating being a slowly soluble, water permeable ethyl cellulose polymer.

4,919,939

PERIODONTAL DISEASE TREATMENT SYSTEM

Richard W. Baker, Palo Alto, Calif., assignor to Pharmetrix Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 856,961, Apr. 29, 1986, Pat. No. 4,780,320. This application Jul. 8, 1988, Ser. No. 216,802

Int. Cl.[5] A61L *15/03*

U.S. Cl. 424—493 **47 Claims**

1. A controlled drug delivery system for placement in a periodontal pocket, comprising:

(a) a plurality of discrete microparticles, between 10 and 500 microns in diameter, comprising a drug and a polymer containing said drug, wherein when said microparticles are placed in an environment of use, said drug is released at a controlled rate by a combination of diffusion of said drug through said polymer and erosion of said polymer; and

(b) a fluid suspending medium for said microparticles; said drug delivery system remaining active in the periodontal pocket for a period of between one and thirty days.

4,919,940

RUMINANT ANIMAL FEED SUPPLEMENT

Fred H. Wellons, Greensboro, N.C., assignor to CBP Resources, Inc., Greensboro, N.C.

Filed Nov. 16, 1988, Ser. No. 272,095

Int. Cl.[5] A23K *1/00*

U.S. Cl. 426—2 **4 Claims**

1. A process for supplying fatty acids containing at least 10 carbon atoms to ruminant animals while protecting the microorganisms in the animal's rumen from attack by the fatty acids comprising feeding highly saturated fatty acids to said animals in the form of triglycerides along with the dry matter content of said animal's feed, wherein said triglycerides are present in an amount effective to protect the microorganisms in the animals rumen from attack by the fatty acids and wherein the iodine value of said triglycerides is no greater than 25.

4,919,941

CHEWING GUM CONTAINING DELAYED RELEASE PROTEIN SWEETENER AND METHOD

Steven E. Zibell, Blue Island, Ill., assignor to Wm. Wrigley Jr. Company, Chicago, Ill.

Continuation-in-part of Ser. No. 134,948, Dec. 18, 1987, which is a continuation-in-part of Ser. No. 921,754, Oct. 22, 1986, abandoned. This application May 24, 1988, Ser. No. 198,138

Int. Cl.[5] A23G *3/30*

U.S. Cl. 426—5 **25 Claims**

1. A method of producing chewing gum containing a delayed release protein sweetener comprising the following steps:

forming an aqueous solution f gelatin and a protein sweetener selected from the group consisting of thaumatin and monellin as well as mixtures thereof, wherein the gelatin is present at between about 1 and about 60 percent by weight of the water;

drying said aqueous solution of protein sweetener and gelatin;

particle sizing said dried protein sweetener and gelatin to produce particles of a sweetener-containing gelatin matrix;

mixing a quantity of said sweetener-containing particles with a zein solution with a zein content between about 5 and about 50 percent by weight, the quantity of the zein solution being limited to that amount which will produce a damp mix which is dust free, non-flowing, and crumbly;

drying the damp mix;

particle sizing said dried mix to thereby obtain zein-coated sweetener-containing particles within a particle size range suitable for chewing gum; and

adding a quantity of said zein-coated sweetener-containing particles to a chewing gum formulation.

4,919,942

METHOD OF MANUFACTURING CHEESE

Douglas L. Willrett, Sioux Falls, S. Dak., and Michael Comotto, Green Bay, Wis., assignors to Nordica International, Inc., Sioux Falls, S. Dak.

Division of Ser. No. 52,254, May 20, 1987, Pat. No. 4,851,347. This application May 15, 1989, Ser. No. 351,214

Int. Cl.[5] A23C *19/02*

U.S. Cl. 426—38 **2 Claims**

1. A method of manufacturing cheese from ultrafiltration retentate having a solids content of from about 30% to about 40% comprising the steps of:

inoculating the retentate with a culture grown in a medium containing from about 15% to about 40% by weight of the following composition:

about 45% to about 50% carbohydrates not fermentable by the culture selected;

about 20% to about 40% milk protein sources;
about 2% to about 10% growth stimulant;
up to about 5% phosphate salts, citrate salts and mixtures thereof;
up to about 2% sodium chloride; and
up to about 1% stabilizer;
for a sufficient period of time to achieve a predetermined pH, and recovering a solid cheese.

4,919,943

PASTA FILATA-TYPE CHEESE PROCESS

Jeng-Jung Yee, and Rajagopalan Narasimhan, both of Green Bay, Wis., assignors to Schreiber Foods, Inc., Green Bay, Wis.

Filed Oct. 16, 1987, Ser. No. 109,821

Int. Cl.[5] A23C *9/14, 19/02*

U.S. Cl. 426—39 **33 Claims**

1. A process for making a pasta filata-type cheese with casein having bound calcium in the range from about 1000 mg to about 3000 mg per 100 g of casein and soluble proteins said process comprising the following steps:

(a) modifying soluble proteins to reduce reactivity of said proteins toward casein so as to produce modified soluble proteins, reactivity of said soluble proteins toward casein being reduced sufficiently to produce cheese having stringy structure and stretchy characteristics of pasta filata type cheese;

(b) combining said casein said modified soluble proteins and cheese ingredients which comprise fat to form a mixture;

(c) plasticizing the mixture to form said pasta filata-type cheese.

4,919,944

PROCESS FOR MANUFACTURING SOFT CHEESES

Guy Bussiere, Ramonville, and Jean Lablee, Mamirolle, both of France, assignors to Roquette Feres, Lestrem, France

Continuation of Ser. No. 942,681, Dec. 17, 1986, abandoned.

This application Jan. 18, 1989, Ser. No. 298,303

Claims priority, application France, Dec. 17, 1985, 85 18688

The portion of the term of this patent subsequent to Jul. 25, 2006, has been disclaimed.

Int. Cl.[5] A23C *19/05, 19/068*

U.S. Cl. 426—39 **12 Claims**

1. A process for manufacturing soft cheeses from milk wherein the milk is acidified in a reproducible and reliable manner for renneting, comprising the steps of:

providing a given volume of milk from which the soft cheese is to be prepared; pl measuring the initial pH and the temperature of said milk;

selecting a period of time within which the pH of the milk will be brought from the initial pH to a renneting pH, said renneting pH being between 6.0 and 6.6 and said renneting pH being the required renneting pH for the type of soft cheese being manufactured;

acidifying the milk for renneting solely by adding an acidogen to the milk, said acidogen being selected from the group consisting of gluconolactones and glucoheptonolactones and said acidogen being added to the milk in an amount which is the minimum amount required to bring the initial pH of the milk to the renneting pH within the selected period of time, said minimum amount of acidogen being determined based on the kinetics of transformation of the acidogen at said temperature of the milk and as a function of the volume of the milk and the selected period of time, whereby the milk is acidified for renneting and brought from the initial pH to the renneting pH solely by the acidogen;

renneting the prepared milk by adding coagulating enzymes to the prepared milk; and then

coagulating;

forming; and

ripening.

4,919,945

USE OF AQUEOUS L-LYSINE SOLUTIONS FOR SUPPLEMENTING FEEDS AND INDISTRIALLY PRODUCED MIXED FEEDS WITH L-LYSINE

Manfred Spindler, Kurfürstenstrasse, and Herbert Tanner, Wildaustrasse, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 552,101, Nov. 16, 1983, abandoned.

This application Feb. 16, 1988, Ser. No. 158,096

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1982, 3242501

Int. Cl.[5] A23K *1/00, 1/22*

U.S. Cl. 426—69 **9 Claims**

1. A method of supplementing feed with L-lysine without increasing the chloride content thereof, comprising the steps of:

(a) providing a mixed fodder; and

(b) supplementing said fodder with an effective amount sufficient to enhance the nutritional value thereof of an aqueous solution consisting essentially of free L-lysine in a concentration of between 30 and 80% by weight, whereby a supplemented fodder is produced.

4,919,946

EDIBLE FOOD PRODUCT

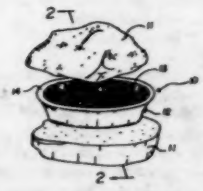
Tong S. Pak, and Tae S. Pak, both of Rt. 15, Box 115, Oak Grove Cir., Statesville, N.C. 28677

Filed Jun. 26, 1989, Ser. No. 371,036

The portion of the term of this patent subsequent to Aug. 23, 2005, has been disclaimed.

Int. Cl.[5] A23L *1/00*

U.S. Cl. 426—89 **16 Claims**



1. A sandwich comprising:

two slices of bread, and

an edible container inserted between said two slices of bread, said edible container housing a food therein and structured to have a V-shaped configuration and contain an outward bent circumferential end edge disposed along the top and a plate bottom thereof for causing the edible container to tightly adhere to the inner surfaces of two slices of bread wherein the food is a food selected from the group consisting of noodles, hot dog, cooked vegetable, fresh salad, cooked or fresh mushroom, barbecue foods, fruit jam, gel butter, and a mixture thereof, whereby the food is contained in a sufficient quantity therein while at the same time it is prevented from falling from the sandwich.

4,919,947

HIGH SOLIDS FILLING MATERIAL AND COMESTIBLE PRODUCT

David L. Barry, Lewisville; Mark L. Dreher, Highland Village; Alan A. Johnson, Irving, and Otto E. Schroeder, Dallas, all of Tex., assignors to Frito-Lay, Inc., Dallas, Tex.

Continuation of Ser. No. 911,358, Sep. 25, 1986, Pat. No. 4,824,684. This application Jan. 5, 1989, Ser. No. 293,982

The portion of the term of this patent subsequent to Apr. 25, 2006, has been disclaimed.

Int. Cl.[5] A21D *13/08;* A23G *3/00*

U.S. Cl. 426—94 14 Claims

1. A pumpable, edible filling composition comprising vegetable shortening and solid particles:

(a) said vegetable shortening making up from about 40% to about 60% by weight of said composition, said vegetable shortening having a Wiley melt point from about 90° F. to about 120° F. and a solid fat index from about 1% to about 6% at 92° F. and at 100° F.;

(b) said solid particles making up at least about 40% by weight of said composition, the solid particles comprising solids extender and solid flavoring material, the solids extender making up from about 10% to about 40% by weight of said composition; and said solid flavoring material making up from about 1% to about 50% by weight of said composition,

wherein substantially all of the solid particles of said composition have a particle size from about 20 microns to about 100 microns and are uniformly dispersed throughout the vegetable shortening.

4,919,948

PROLONGING THE SHELF LIFE OF FRESH ROOT VEGETABLES

Avigdor Orr, Highland Park; John O. Spingler, Plainsboro, and Seymour G. Gilbert, Piscataway, all of N.J., assignors to DNA Plant Technology Corporation, Cinnaminson, N.J.

Continuation of Ser. No. 930,503, Nov. 12, 1986, Pat. No. 4,808,420, which is a continuation of Ser. No. 650,776, Sep. 13, 1984, Pat. No. 4,670,275. This application Jan. 23, 1989, Ser. No. 300,871

The portion of the term of this patent subsequent to Jun. 2, 2004, has been disclaimed.

Int. Cl.[5] A23B *7/148*

U.S. Cl. 426—106 4 Claims

1. The product prepared by a process of maintaining a fresh root vegetable in viable form which comprises:

(a) peeling the surface of a fresh root vegetable having endogenous microflora present therein;

(b) providing the vegetable in uniform sized pieces,

(c) subjecting the vegetable having endogenous microflora present therein to elevated temperature and time conditions effective to reduce the endogenous microflora concentration in colony forming units (CFU)/g by a factor greater than 10^2 while maintaining the vegetable in a viable form and substantially maintaining the sensory qualities of color, taste and texture of the fresh root vegetable,

(d) rapidly cooling the heat treated vegetable to below about 25° C. in less than about two minutes,

(e) subjecting the vegetable to a vacuum of about 1 to about 12 inches Hg absolute for about 2 to about 10 minutes,

(f) breaking the vacuum in the presence of water,

(g) removing surface water from the vegetable, and

(h) providing the vegetable in a sealed container effective to prevent microbial recontamination of the vegetable and having a gas permeability effective to maintain the vegetable in a viable condition.

4,919,949

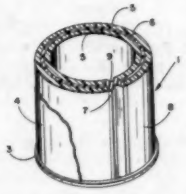
REFRIGERATED DOUGH CONTAINER

Joseph Miltz, Haifa, Israel; Robert A. Strange, Crystal, and Joseph C. McDilda, Brooklyn Park, both of Minn., assignors to The Pillsbury Co., Minneapolis, Minn.

Filed Oct. 6, 1988, Ser. No. 254,072

Int. Cl.[5] B65D *85/36*

U.S. Cl. 426—128 16 Claims



1. A food storage system for the storage and distribution of food products, said system comprising:

a thermoplastic tubular sidewall having a major first region and an integral second fracture region extending generally between opposite ends of said tubular sidewall said second fracture region having a tear initiation strength at least about 4 times greater than a tear propagation strength being operable to control the course of a fracture after initiation:

end closure means secured to said sidewall and closing said opposite ends of said tubular sidewall; and

a pressurized food product contained in said container.

4,919,950

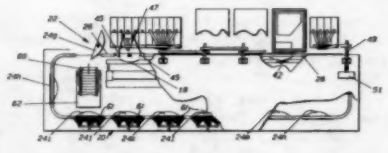
COMPUTER CONTROLLED, FULLY AUTOMATIC, SHORT-ORDER WOK COOKING SYSTEM FOR PREPARING STIR-FRIED CHINESE FOOD

Stephen M. Mak, Los Angeles, Calif., assignor to Larry B. Harvey, Los Angeles, Calif.

Filed Jul. 27, 1988, Ser. No. 224,740

Int. Cl.[5] A23L *1/01;* A47J *27/00*

U.S. Cl. 426—233 18 Claims



1. An apparatus for fully automatic cooking of short order meals comprising:

a plurality of cooking containers;

a conveyor means for advancing said plurality of cooking containers along a predetermined path;

heating means for heating said plurality of cooking containers as said cooking containers are advanced along said predetermined path by said conveyor means;

food dispensing means for selectively dispensing a selected amount of selected food to a selected one of said cooking containers at a selected point on said predetermined path;

stirring means for stirring food ingredients within selected ones of said cooking containers at selected points on said predetermined path; and

computer control means coupled to said conveyor means, heating means, food dispensing means and stirring means for controlling operation of each of said means according to an arbitrarily selected customer order selectively as-

signed to each one of said cooking containers as said cooking container is advanced along said predetermined path,

whereby cooked meals are automatically prepared according to a short order selection entered through said computer control means.

4,919,951

METHOD FOR THE HEAT CURING OF RAW MEAT PRODUCTS

Hans C. S. Jensen, Vejle, and Henning Pedersen, Borkop, both of Denmark, assignors to Tulip Slagterierne A.M.B.A., Vejle, Denmark

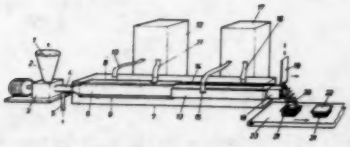
PCT No. PCT/DK87/00119, § 371 Date Jun. 2, 1988, § 102(e) Date Jun. 2, 1988, PCT Pub. No. WO88/02222, PCT Pub. Date Apr. 7, 1988

PCT Filed Oct. 2, 1987, Ser. No. 203,087

Claims priority, application Denmark, Oct. 2, 1986, 4718/86

Int. Cl.[5] A23L *3/22*

U.S. Cl. 426—241 **10 Claims**



1. A method for heat curing a raw meat medium, the method comprising:

conveying the meat medium through a pipe, and

passing at least one electromagnetic field through the pipe into the meat medium, the electromagnetic field having a frequency of less than 300 MHz, whereby meat medium is heat cured.

4,919,952

PROCESS FOR THE PRODUCTION OF LIGHT COLORED FOOD GRADE PROTEIN AND DIETARY FIBRE FROM GRAINBY-PRODUCTS

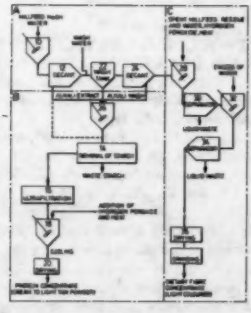
Gobind T. Sadaranganey, Mississauga; Wendy Zellen, Weston, and John Michaelides, Mannheim, all of Canada, assignors to Robin Hood Multifoods Inc., Rexdale, Canada

Continuation of Ser. No. 927,363, Nov. 6, 1986, abandoned. This application Feb. 8, 1989, Ser. No. 309,903

Claims priority, application Canada, Nov. 3, 1986, 522084

Int. Cl.[5] A21D *6/00*; A23L *1/277*

U.S. Cl. 426—254 **10 Claims**



1. An integrated process for preparing food grade bleached purified stable protein and dietary fibre concentrates from wheat millfeed comprising the steps of:

(a) mixing wheat millfeed of particle size less than 1680 μm with an alkali solution to produce a slurry with solvent-/millfeed ratio in the range of 7:1 to 10:1 v/w and having pH in the range of pH 9–11;

(b) separating the slurry to remove the alkali liquid to isolate alkali extract and form a millfeed residue;

(c) removing starch and fat from the alkali extract;

(d) ultrafiltration of the alkali extract to form a retantate using a semi-permeable membrane;

(e) bleaching the retantate by adding hydrogen peroxide and heating;

(f) cooling and drying the bleached retantate to provide a protein concentrate;

(g) adding water and 35–70% w/v hydrogen peroxide to said millfeed residue to produce a slurry;

(h) heating said slurry containing millfeed residue to a temperature of 50°–100° C.; and

(i) decanting liquid from the slurry and drying the residue to produce a dietary fibre concentrate.

4,919,953

PROCESS FOR PREPARING A ROOT VEGETABLE COATED AND FRIED FOOD PRODUCT

Peter Palmlin, and Marianne Rudberg, both of Helsingborg, Sweden, assignors to Nestec S.A., Vevey, Switzerland

Filed Mar. 9, 1989, Ser. No. 321,364

Claims priority, application European Pat. Off., Mar. 19, 1988, 88104427.5

Int. Cl.[5] A23L *1/214, 1/217, 1/314, 1/325*

U.S. Cl. 426—273 **14 Claims**

1. A process for preparing a frozen food product comprising pre-frying individual particles of fresh root vegetables to a moisture content of from 20% to 50% by weight based on the total weight of the pre-fried particles and then freezing the pre-fried particles, coating a foodstuff with an edible heat-settable adhesive fluid and then coating the adhesive-coated foodstuff with the frozen, pre-fried particles, frying the particles-coated foodstuff and then deep-freezing the fried, coated foodstuff.

4,919,954

COMPOSITIONS AND METHODS OF DECORATING FIRM-RINDED FRUIT

McShane James E., Memphis, Tenn., assignor to Plough, Inc., Memphis, Tenn.

Filed Dec. 20, 1988, Ser. No. 287,196

Int. Cl.[5] A23L *1/27*; A23P *1/08*

U.S. Cl. 426—308 **7 Claims**

1. A method of decorating the outside surface of a firm-rinded fruit of vines of the genus Cucurbita with a non-toxic, peelable film of predetermined design which comprises the steps of (1) applying to substantially the entire outer surface of said fruit a first coating comprising a homogeneous colorant-free film-forming composition containing a film-forming amount of polyvinyl alcohol, a volatile solvent, a viscosity enhancing agent and at least one preservative; (2) allowing the volatile solvent to evaporate to form a first coating of a non-toxic peelable film on substantially the entire outer surface of said fruit; (3) applying to the surface of said first coating at least one homogeneous film-forming composition containing a film-forming amount of a polyvinyl alcohol, a plasticizer, a volatile solvent and an amount of a colorant or a mixture of colorants sufficient to mask the color of said fruit; and (4) allowing the solvent to evaporate thereby forming a non-toxic, peelable film of predetermined design on the first coating on the outer surface of said fruit.

4,919,955

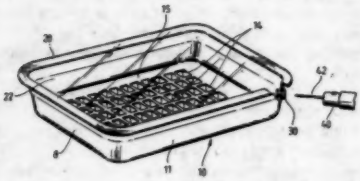
METHOD FOR PACKAGING PERISHABLE PRODUCTS

Jerry L. Mitchell, P.O. Box 667, Livingston, Tex. 77351

Division of Ser. No. 94,384, Sep. 8, 1987, abandoned. This application Jun. 27, 1988, Ser. No. 214,195

Int. Cl.[5] B65B *31/04*

U.S. Cl. 426—394 12 Claims



1. A method for processing a perishable fresh meat product for controlled aging and subsequent presentation to the consumer, comprising the sequential steps of:

positioning the product on a gas impermeable package tray;

sealing said product on said tray in a non-inert atmosphere with a gas impermeable cover so as to form a gas tight package;

inserting an atmosphere exchange apparatus through a septum valve disposed in the tray

removing the non-inert gas from within the package through said valve disposed in said package;

filling the interior of the package through said valve with a first gas capable of forming an anaerobic atmosphere in said package;

aging said product in the anaerobic atmosphere in said package;

removing said first gas from said package though said valve;

filing the interior of said package with a second gas conducive to the formation of oxymyoglobin in said meat product;

maintaining said meat product in said package in said second gas for at least a time sufficient to product a bloom in said meat product;

removing said second gas from the package through said valve; and

freezing said product while in said package.

4,919,956

METHODS FOR DRYING HONEY AND MOLASSES

George F. Bateson, Roseville; Charles A. Morris, Brooklyn Park, and Glenn C. Heuer, St. Paul, all of Minn., assignors to Ogilvie Mills, Inc., Keokuk, Iowa

Filed Jan. 17, 1985, Ser. No. 692,609

Int. Cl.[5] A23P *1/12*

U.S. Cl. 426—465 9 Claims

1. A method for drying a liquid selected from the group consisting of liquid honey and liquid molasses, and liquid mixtures of at least one of liquid honey and liquid molasses with any one or more of a starch carrier, corn syrup in an amount of from up to 15% by weight of the total liquid mixture; hydroxylated lecithin up to about 3% by weight of the total liquid mixture; soya flour in an amount of up to about 15% by weight of the total liquid mixture; high fructose corn syrup in an amount up to about 33% by weight of the total liquid mixture; water in an amount of up to 20% by weight of the total liquid mixture, the method comprising extruding the liquid, without any substantial predrying thereof, in an extrusion dryer at a sufficient temperature to remove moisture from the liquid to yield a cooled, dried, low moisture product, and collecting the low moisture product.

4,919,957

METHOD FOR MAKING SHRIMP-SHAPED FOOD PRODUCTS

Horoji Ikeuchi, and Kiyoaki Ikeuchi, both of Akashi, Japan, assignors to Kabushiki Kaisha Ikeuchi Tekkosho, Akashi, Japan

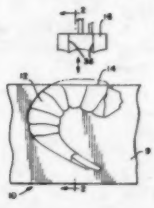
Continuation-in-part of Ser. No. 75,575, Jul. 20, 1987, Pat. No. 4,748,039. This application May 5, 1988, Ser. No. 190,369

Claims priority, application Japan, Jan. 22, 1987, 62-13104; May 6, 1987, 62-111519

The portion of the term of this patent subsequent to May 31, 2005, has been disclaimed.

Int. Cl.[5] A23L *1/325;* A23P *1/00*

U.S. Cl. 426—513 4 Claims



1. A process for making a food product, comprising the steps of

1. combining edible material including ground fish meat;
2. molding said material to the shape of the torso of a shrimp;
3. cutting a continuous groove along the back of said torso and forming ridges on both sides of said groove; and
4. heating and solidifying said torso and swelling said ridges to cause said ridges to extend outwardly from said groove.

4,919,958

FLAN-TYPE PUDDING

Ranjit S. Kadan, New Orleans, and George M. Ziegler, Jr., Harahan, both of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jan. 30, 1989, Ser. No. 303,328

The portion of the term of this patent subsequent to Feb. 2, 2005, has been disclaimed.

Int. Cl.[5] A23C *9/154;* A23L *1/04, 1/187*

U.S. Cl. 426—573 16 Claims

1. An egg-free composition comprising a mixture of: milk, sweetener, rice flour, carrageenan, tetra potassium pyrophosphate, pectin, locust bean gum, and at least one material selected from the group consisting of cheese whey protein isolate and xanthane gum

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4,919,959

METHOD OF PRODUCING A TEXTURIZED MATERIAL OF A MARINE PRODUCT FROM SURIMI OF THE SAME

Hideaki Hosaka, Fukuyama; Noboru Nakatani, Saeki; Kiyotaka Aoki, Hiroshima, and Koichi Shimaoka, Osaka, all of Japan, assignors to Ajikan Co. Ltd., Japan

Continuation of Ser. No. 14,714, Feb. 13, 1987, abandoned. This application Aug. 22, 1988, Ser. No. 235,718

Claims priority, application Japan, Feb. 17, 1986, 61-032553

Int. Cl.[5] A23L *1/325*

U.S. Cl. 426—574 1 Claim

1. A method of producing a texturized material of a marine product from surimi of the same, comprising the steps of:

pretreating said surimi by one of heat-treating said surimi, adding and mixing additional raw material to and into said surimi and subsequently heat-treating the resulting mixture, drying by means of dehydration said surimi so that the water content thereof is between 25 and 70 percent,

and gelling said surimi through the setting of the same, so as to form a pretreated material;

feeding to a twin-screw extruder at least one said pretreated material; and

pressurizing said at least one pretreated material under pressure of 7 to 30 kg/cm^2 while simultaneously heating said at least one pretreated material to a temperature of 150° to 190° C., by means of said twin-screw extruder, thereby processing it into a texturized material.

4,919,960

PROCESS OF MAKING A CARBONATED LIQUID DAIRY PRODUCT

Salah H. Ahmed, Elk Grove Village; John D. Kadlec, North Aurora, and Anthony J. Luksas, Downers Grove, all of Ill., assignors to Dairy Research, Inc., Rosemont, Ill.

Continuation-in-part of Ser. No. 94,304, Sep. 8, 1987, Pat. No. 4,804,552. This application Sep. 26, 1988, Ser. No. 248,742

The portion of the term of this patent subsequent to Feb. 14, 2006, has been disclaimed.

Int. Cl.^{5} A23C *9/133, 9/14, 9/154*

U.S. Cl. 426—580 **39 Claims**

1. A method for carbonating a composition containing a liquid dairy product, to a high level of carbonation, while not destabilizing the composition, comprising:

(1) heating a composition containing a liquid dairy product within a temperature/time range of at least 160° F. for a time not in excess of 30 minutes to 200° F. for a time not in excess of 5 seconds and whereby the indigenous protein and ash in the liquid dairy product are at least partially denatured to form a buffer thereof;

(2) cooling the denatured composition to a temperature of less than 50° F.;

(3) subjecting the cooled composition to pressurized carbon dioxide at sufficient pressures and for a sufficient time such that the taste and mouth feel of the composition has substantially no taste and mouth feel of the liquid dairy product contained in the composition, provided that at least 1.5 volumes of carbon dioxide are dissolved in the carbonated composition;

(4) before, during or after either of steps 1, 2 or 3, adding to said composition an other liquid food ingredient; and

(5) packaging the carbonated composition in closed containers capable of retaining the said degree of carbonation;

and wherein the amount and extent of the heat denatured protein and ash in the carbonated composition is sufficient that the composition is buffered to a pH of at least about 3.8 and up to 5.7 and the carbonated composition is not destabilized.

4,919,961

LACTO-N-TETRAOSE CONTAINING FOOD-STUFF AND A PROCESS FOR ITS PREPARATION

Arne Lundblad, Bytaregatan, Sweden, assignor to Biocarb AB, Sweden

Filed Oct. 19, 1988, Ser. No. 259,745

Claims priority, application Sweden, Oct. 22, 1987, 8704115

Int. Cl.^{5} A23C *9/13;* **A23L** *1/30*

U.S. Cl. 426—580 **12 Claims**

1. Food-stuff having added thereto Lacto-N-tetraose in an amount effective to stabilize bacterial flora in faeces, said lacto-N-tetraose being of synthetic origin or isolated from human milk, said food-stuff not being human milk.

4,919,962

COFFEE FLAKES AND PROCESS

Vijay K. Arora, Montvale, N.J.; Gary V. Jones, Bremen, Fed. Rep. of Germany; John M. Kovtun, Rahway, and Lawrence S. Brandlein, Englishtown, both of N.J., assignors to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 231,811, Aug. 12, 1988, abandoned. This application Sep. 22, 1988, Ser. No. 247,982

Int. Cl.^{5} A23F *5/38*

U.S. Cl. 426—594 **7 Claims**

1. A method of forming a transparent, stable coffee glass comprising:

(a) preparing a mixture of 100% coffee derived solids comprising about 4%–12% water and 88% to less than 96% coffee solids, said mixture having a glass transition temperature of 30° C. to 80° C.;

(b) heating the mixture to a temperature of 60° C. to 130° C.;

(c) blending to form a uniform and homogeneous mixture;

(d) forcing said mixture through a restricted area to shape it;

(e) pulling the mixture at a rate of speed greater than the shaped mixture exits the restricted area to stretch and cool the mixture to form a thin, continuous, homogeneous, solid, transparent, film of coffee glass exhibiting luster on both the top and bottom surface of the film;

(f) breaking the film; and

(g) recovering the broken film at a stable moisture content of 6% water or less.

7. The product produced by the process of claim 1.

4,919,963

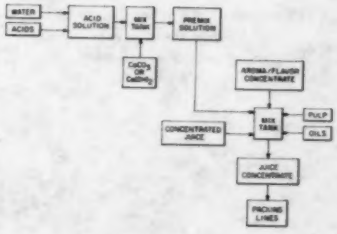
METHOD OF PREPARING FRUIT JUICE BEVERAGES AND JUICE CONCENTRATES NUTRITIONALLY SUPPLEMENTED WITH CALCIUM

David C. Heckert, Oxford, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 860,607, May 7, 1986, Pat. No. 4,722,847. This application Dec. 11, 1987, Ser. No. 131,956

Int. Cl.^{5} A23L *2/02*

U.S. Cl. 426—599 **19 Claims**



1. A method for preparing a calcium-supplemented fruit juice product which comprises the steps of:

(a) forming an at least meta-stable aqueous premix solution of solubilized calcium comprising:

(i) from about 0.05 to about 0.26% by finished, single-strength fruit juice product weight, solubilized calcium, wherein the source of said solubilized calcium is selected from the group consisting of calcium carbonate, calcium oxide and calcium hydroxide;

(ii) from about 0.4 to about 4.0% by finished, single-strength fruit juice product weight, of an acid component consisting essentially of citric acid and malic acid in a weight ratio of from about 5:95 to about 90:10; and

(iii) water; and

(b) combining said premix solution of solubilized calcium with fruit juice material comprising concentrated fruit juice having a sugar content from about 20° to 80° Brix, to provide a finished, single-strength, calcium supplemented fruit juice product having: (1) at least about 45% fruit

juice; and (2) a sugar content of from about 2° to about 16° Brix.

4,919,964

SHELF STABLE, HIGHLY AERATED REDUCED CALORIE FOOD PRODUCTS

Keith D. Adams; Dana P. Gruenbacher, and Kathleen H. Noble, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 22, 1988, Ser. No. 288,846
Int. Cl.[5] A23D 3/00, 5/00
U.S. Cl. 426—564 21 Claims

1. A fatty composition comprising:

(a) at least about 20% by weight fat substitute selected from the group consisting of sugar fatty acid polyesters and sugar alcohol fatty acid polyesters, and mixtures thereof, wherein the sugars and sugar alcohols contain from 4 to 8 hydroxyl groups, wherein the polyesters contain at least four fatty acid ester groups, and wherein each fatty acid group has from about 2 to about 24 carbon atoms;

(b) not more than about 80% by weight fatty composition ingredients selected from the group consisting of triglyceride fats, fat substitutes other than the sugar fatty acid polyesters and sugar alcohol fatty acid polyesters of part (a) hereinabove, emulsifiers, flavorings, colorings, anti-spattering agents, anti-sticking agents, anti-oxidants, an mixtures thereof;

(c) wherein the fatty composition additionally comprises from about 25% to about 75% by volume edible gas dispersed uniformly in the fatty composition; and

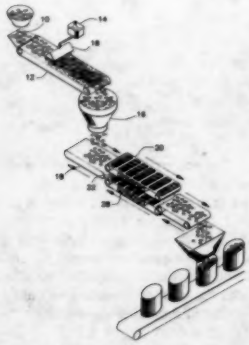
(d) wherein the fat substitute of part (a) hereinabove has a viscosity of at least about 0.5 poise at 100° F. (37.8° C.) after 10 minutes of steady shear at a shear rate of 10 seconds^{-1}, and a liquid/solid stability at 100° F. (37.8° C.) of at least about 30%.

4,919,965

METHOD OF TOASTING SLICES OF POTATO AND OTHER PRODUCE

Melvin D. Childers, Jr., 7112 Baltusrol La., Charlotte, N.C. 28210

Filed Nov. 21, 1988, Ser. No. 273,980
Int. Cl.[5] A23L 1/217
U.S. Cl. 426—615 10 Claims



1. A process of preparing toasted slices of agricultural produce to produce in a single cooking step a crisp chip snack food product essentially free of added oils and fats and directly edible without further preparation which consists essentially of the steps of:

washing raw agricultural produce,

slicing the washed raw agricultural produce into thin slices,

applying seasoning to the thin slices of raw agricultural produce and allowing the seasoning to dwell on the raw slices for a sufficient period of time to allow it to be absorbed into the raw slices, and

cooking the seasoned raw slices under heat and pressure imposed between an opposing pair of heated cooking surfaces so as to drive out moisture from the slices and toast the slices.

4,919,966

COVERING SUCH AS A GLOVE, CONDOM OR SHEATH FOR INHIBITING THE SPREAD OF CONTAGIOUS DISEASES AND METHODS OF MAKING AND USING THE SAME

Robin R. T. Shlenker, 2165 E. Alameda Ave., Denver, Colo. 80209

Continuation-in-part of Ser. No. 74,679, Jul. 17, 1987, Pat. No. 4,771,482. This application Jan. 13, 1988, Ser. No. 143,184
Int. Cl.[5] A01N 1/02; A41D 19/00
U.S. Cl. 427—2 86 Claims

44. A method of making a covering for inhibiting the spread of a contagious disease comprising the steps of:

providing a layer of sponge-like material possessing a plurality of chambers numbering at least two hundred and wherein the volume of substantially each chamber is less than two cubic millimeters;

providing a sterilizing fluid capable of substantially immediately sterilizing the microbes causing the disease;

applying the sterilizing fluid to the sponge-like material layer such that the sterilizing fluid is contained with the chambers; and

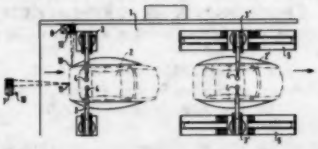
sealing the surfaces of the sponge-like material layer to substantially retain the sterilizing fluid within the sponge-like material layer.

4,919,967

METHOD AND APPARATUS FOR COATING PARTS IN SERIES

Heinz Handke, Gemmrigheim; Thomas Zink, Stuttgart, and Vasilios Sougioltzis, Bietigheim-Bissingen, all of Fed. Rep. of Germany, assignors to Behr Industrieanlagen GmbH & Co., Ingersheim, Fed. Rep. of Germany

Filed Jun. 30, 1988, Ser. No. 213,351
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1987, 3722734
Int. Cl.[5] B05D 1/04, 5/02, 12/08
U.S. Cl. 427—8 10 Claims



1. A method for serially coating parts moved along a predetermined path in a stationary spray booth including an adjust-

able spraying device, the method comprising the steps of: moving a first part through the spray booth; measuring the distance between a point in the spray booth and a point on the first part to establish a first reference distance; storing the first reference distance value in a processing program of an operation controlling a computer as a standard first reference distance; moving the first part out of the spray booth; moving a second like part through the spray booth (1); remeasuring the first reference distance between the point in the spray booth and the point on the second part by measuring the time lapse between the emission and reception of a signal reflected by the second part; comparing positional deviations between the remeasured first reference distance value and the stored first reference value; and adjusting the spraying device for optimum coating of the part in response to the compared positional deviations.

8. A coating apparatus for serially coating parts moved along a predetermined path, said apparatus comprising: a stationary spray booth; conveyor means for moving a part through said spray booth along a predetermined path; at least one adjustable spraying device disposed in said spray booth and supplied with coating material for automatically depositing the coating material on the part; means for establishing a predetermined reference distance between a point on a first part and a point in said spray booth; and characterized by including comparator means for remeasuring said predetermined reference distance between a second and successive parts and said spray booth by measuring the time lapse between the emission and reception of a signal reflected by the second and each successive part and comparing positional deviations between said remeasured reference distance and said predetermined reference distance, and adjusting said spraying device for optimum coating of the second and each successive part in response to said deviations.

4,919,968

METHOD AND APPARATUS FOR VACUUM VAPOR DEPOSITION

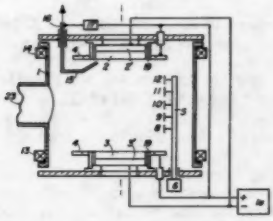
Rainer Buhl, Sargans, Switzerland, and Christof Peyer, Schaan, Liechtenstein, assignors to Balzers Aktiengesellschaft, Fürstentum, Liechtenstein

Filed Mar. 2, 1988, Ser. No. 163,296

Claims priority, application Switzerland, Mar. 6, 1987, 00841/87

Int. Cl.[5] B05D 3/06

U.S. Cl. 427—37 **8 Claims**



1. A method for vacuum coating a substrate, comprising the steps of:

generating a first evaporation by at least one electric arc discharge between an anode and a cathode in a vacuum chamber, said electric arc discharge evaporating material comprising a metal from the cathode, at least one arc spot moving along a surface of said cathode;

exposing said substrate to a vapor comprising at least a part of said material evaporated from said cathode; and,

reducing the occurrence of emitted droplets at said at least one moving arc spot by

generating a second evaporation of a material during the generation of said first evaporation,

coating said surface of said cathode with a coating comprising said material evaporated by said second evaporation, said coating of said surface being disruptable by said electric arc,

so as to prevent said electric arc from directly hitting material of which said cathode is made as said arc spot moves along said cathode surface.

4,919,969

METHOD OF MANUFACTURING A SEAL

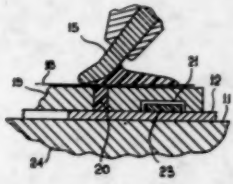
Robin A. Walker, Tewkesbury, England, assignor to Dowty Seals Limited, England

Filed Mar. 26, 1987, Ser. No. 30,888

Claims priority, application United Kingdom, Apr. 1, 1986, 8607976

Int. Cl.[5] B05D 5/12, 1/32, 3/02

U.S. Cl. 427—58 **6 Claims**



1. A method of manufacturing a seal which includes at least a first and a subsequent layer of seal material, which method comprises:

(a) printing the first layer of seal material onto a substrate using a stencil;

(b) printing the subsequent layer of seal material onto the substrate using a further stencil; and

(c) curing, at least partially, the first and the subsequent layer of seal material printed onto the substrate;

wherein the further stencil has a recess pattern formed in a surface thereof which co-operates with the substrate so as to accommodate the first layer of seal material printed onto the substrate.

4,919,970

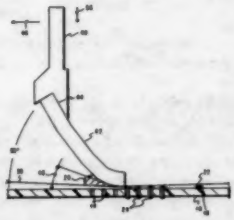
SOLDER DEPOSITION CONTROL

Karl G. Hoebener, Georgetown, and John J. Stankus, Austin, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 15, 1986, Ser. No. 907,265

Int. Cl.[5] B05D 5/12

U.S. Cl. 427—96 **7 Claims**



1. A single step process for depositing solder through a mask, using a resilient blade, onto pads for surface mountable components and into plated through holes for leaded compo-

nents said pads and plated through holes being provided on and in a printed circuit substrate, comprising the steps of:

controlling the amount of solder deposited on the surface mount lands as a function of mask thickness; and

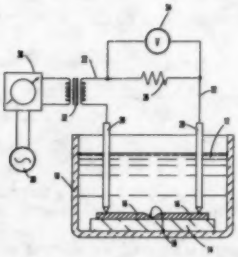
simultaneously and independently controlling the amount of solder deposited into the plated through holes as a function of the hardness of the blade and an angle between the blade and mask surface.

4,919,971

SELF-INDUCED REPAIRING OF CONDUCTOR LINES

Chengjua J. Chen, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 23, 1988, Ser. No. 248,889
Int. Cl.[5] B05D 5/12
U.S. Cl. 427—98 26 Claims



1. A method for repairing partially defective conductor lines, wherein said defect is formed by thinning of a portion of said line, comprising the steps of,

selectively heating at least one partially defective site in said conductor line by passing a high current, and,

inducing deposition of a conductive material at said partially defective site, thereby repairing said conductor line.

4,919,972

PROCESS FOR SURFACE MODIFICATION OF POLYMER ARTICLES

Neal Conrad, Trenton; Michael T. Burchill, Cranbury; Joseph Silbermana, Old Bridge; Thomas Hoffman, Brick, all of N.J., and Maurice Bourrel, Pau, France, assignors to M & T Chemicals Inc., Woodbridge, N.J.

Continuation-in-part of Ser. No. 945,595, Dec. 23, 1986, Pat. No. 4,770,905. This application Jul. 28, 1988, Ser. No. 225,448
Int. Cl.[5] B05D 5/00
U.S. Cl. 427—160 18 Claims

1. A modifier composition for incorporating a modifier ingredient into the surface region of a resinous article, consisting essentially of:

(a) about 1–60% by weight of a U.V. stabilizer dissolved in,

(b) a resin-swellable organic solvent, and

(c) about 0.1–6% by weight of a surfactant additive.

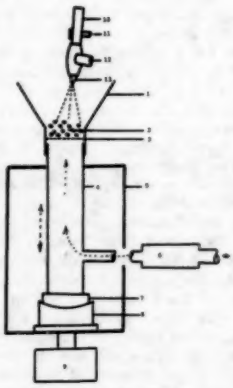
15. A process according to claim 14 wherein said liquid is water present as an upper layer, and said modifier composition is present as a lower layer, wherein said modifier composition is pumped from said lower layer into said upper layer and directed onto the surface of said article which is immersed in said upper layer whereby said modifier ingredient is incorporated into the contacted surface.

4,919,973

COATING APPARATUS FOR SMALL-SCALE PROCESSING

M. Hayat Alkan, Chicago, and Michael J. Groves, Lincolnshire, both of Ill., assignors to Board of Trustees of the University of Illinois, Chicago, Ill.

Filed Oct. 16, 1987, Ser. No. 109,229
Int. Cl.[5] B05D 1/22
U.S. Cl. 427—213 3 Claims



1. In a method for coating variously shaped particles and comprising the steps of:

fluidizing said particles,

spraying coating materials onto said particles to form coated particles, and

subjecting said particles to gas flow to dry said coated particles,

the improvement comprising:

the step of fluidizing said particles solely through application of vibratory energy of varying amplitude and frequency, and

the step of directing downwardly said gas flow to dry said coated particles.

4,919,974

MAKING DIAMOND COMPOSITE COATED CUTTING TOOLS

Robert C. McCune, Birmingham, and Ronald J. Baird, Livonia, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 12, 1989, Ser. No. 296,263
Int. Cl.[5] C23G 16/00
U.S. Cl. 427—249 22 Claims

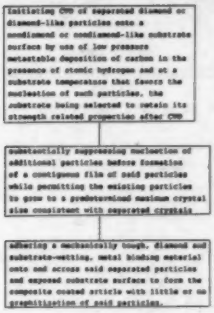
1. A method of making a composite coated article by the steps of:

(a) initiating chemical vapor deposition of separated diamond or diamond-like particles onto a nondiamond or nondiamond-like substrate surface by use of low pressure metastable deposition of carbon in the presence of atomic hydrogen and at a temperature that favors the nucleation of such particles, the substrate being selected to facilitate such diamond or diamond-like deposition and to retain its strength related properties after said chemical vapor deposition;

(b) substantially suppressing nucleation of additional particles before formation of a contiguous film of said particles while permitting the existing particles to grow to a predetermined maximum crystal size consistent with separated crystals; and

(c) adhering a mechanically tough diamond and substrate-

wetting, metal binding material onto and across said separated particles and exposed substrate surface to form the


initiating CVD of separated diamond or diamond-like particles onto a nondiamond or nondiamond-like substrate surface by use of low pressure metastable deposition of carbon in the presence of atomic hydrogen and at a substrate temperature that favors the nucleation of such particles, the substrate being selected to retain its strength related properties after CVD
substantially suppressing nucleation of additional particles before formation of a contiguous film of said particles while permitting the existing particles to grow to a predetermined maximum crystal size consistent with separated crystals
adhering a mechanically tough, diamond and substrate-wetting, metal binding material onto and across said separated particles and exposed substrate surface to form the composite coated article with little or no graphitization of said particles.

composite coated article with little or no graphitization or dissolution of said particles.

4,919,975
METHOD OF PRODUCING A PAINTED MARBLEIZED FINISH ON AN EXPOSED SURFACE

Evan W. Jones, Surfside, assignor to BPMF, Inc., Miami, Fla.

Filed Dec. 3, 1987, Ser. No. 128,232
Int. Cl.[5] B05D *5/00, 1/28, 1/36*
U.S. Cl. 427—260 **12 Claims**

1. A method of producing a painted marbleized finish on an exposed surface such as a wall or a ceiling, said method comprising the steps of:

(a) preparing the exposed surface by at least insuring that the exposed surface is substantially clean and free of contaminants;

(b) placing a supply of base coat paint on an outer applicator surface of a hand-held applicator;

(c) applying the base coat paint by forming a plurality of overlapping application marks of the base coat paint on the exposed surface by patting the applicator surface of the applicator repeatedly over at least one designated portion of the exposed surface;

(d) placing a supply of an accent coat paint of a different, contrasting color than the base coat paint on the same applicator and while the applied base coat paint is still wet on the exposed surface, applying the accent coat paint by forming a plurality of application marks of the accent coat over the base coat paint on the on designated portion of the exposed surface;

(e) positioning the application marks of the accent coat in spaced relation to one another;

(f) subsequently patting the exposed surface within the designated portion with the applicator surface of the applicator and thereby performing an initial blending of the plurality of application marks of the accent coat toward one another from their original spaced apart locations until each of the plurality of application marks of the accent coat is blended into one another and is substantially indistinguishable from one another;

(g) performing a subsequent blending of the accent coat into the still wet base coat by continuously patting the applied accent coat with the applicator surface and allowing small portions of the base coat as well as small quantities of the accent coat to be viewable through the blended exposed surface; and

(h) performing a final blending of the accent coat into the base coat by additional continuous patting by the applicator surface of the accent coat and base coat until a desired depth of color having a painted marbleized finish in appearance is achieved over the one designated portion of the exposed surface.

4,919,976
INSULATING ADHESIVE TAPE COMPOSITION AND COMPOSITES THEREOF

Frank C. Cesare, Woodbury; Robert G. Davis, and William D. Sigworth, both of Naugatuck, all of Conn., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn.

Continuation of Ser. No. 88,695, Aug. 17, 1987, abandoned, which is a continuation of Ser. No. 769,208, Aug. 23, 1985, abandoned. This application May 8, 1989, Ser. No. 348,840
Int. Cl.[5] B05D *3/02*
U.S. Cl. 427—373 **9 Claims**

1. A method of insulating a plurality of rigid panels which are subjected to a high temperature paint treatment, said method comprising the steps of:

adhering to said plurality of rigid panels an uncured insulating tape composed of (a) a major amount of an ethylene/-propylene nonconjugated polyene terpolymer having a number average molecular weight of between about 500 and about 14,000 (b) between about 0.5 and about 5.0 parts by weight of curative, based upon the weight of said terpolymer, (c) between 0.1 and about 10.0 parts be weight of a blowing agent based upon the weight of said terpolymer, and (d) between 0 and about 200 parts by weight of a filter based upon the total weight of said terpolymer, to form an uncured insulated composite;

conveying said uncured insulated composite into said high temperature paint treatment;

heating said uncured insulated composite at temperatures high enough to activate said curative;

curing and adhering said uncured insulating tape to said plurality of rigid panels, to form a cured composition; and

cooling said plurality of rigid panels.

4,919,977
COATING METHOD

Takakazu Yamane; Yoshio Tanimoto; Tadamitsu Nakahama; Makoto Aizawa, and Tsuneo Kishimoto, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

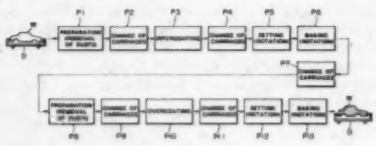
Continuation of Ser. No. 153,669, Feb. 8, 1988, abandoned. This application Mar. 15, 1989, Ser. No. 323,237
Claims priority, application Japan, Feb. 10, 1987, 62-27390; Feb. 10, 1987, 62-27392; Feb. 10, 1987, 62-27393; Feb. 13, 1987, 62-29873; Apr. 1, 1987, 62-77528
Int. Cl.[5] B05D *3/02*
U.S. Cl. 427—379 **59 Claims**

1. A coating method for coating a vehicle body in a coating line, comprising:

a first step of spraying an intercoating paint containing a volatilizable solvent over a surface of an undercoated vehicle body to form an intercoat layer thereon, wherein the intercoating paint is sprayed so that the intercoat layer has a film thickness which is greater than a thickness at which intercoating paint sags at least on a surface of the undercoated vehicle body extending in a substantially vertical direction;

a second step of drying the intercoat layer formed in the first

step, the second step comprising sequential setting and baking steps wherein the vehicle body is held at a first ambient temperature during the setting step and a second ambient temperature during the baking step, wherein the first ambient temperature is lower than the second ambient temperature, wherein the vehicle body is rotated about its substantially horizontal axis, and wherein the



rotation of the vehicle body is carried out at least in the setting step at a speed which is high enough to rotate the body before the paint coated thereon substantially sags due to gravity yet which is low enough so as to cause no sagging as a result of centrifugal force;

a third step of spraying an overcoating paint over said intercoat layer to form an overcoat layer; and

a fourth step of drying said overcoat layer.

4,919,978

PRODUCTION OF FIBER COMPOSITES

Matthias Winkler, Lenningen; Peter Ittemann, and Hans G. Matthies, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 16, 1988, Ser. No. 285,746

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1987, 3742833

Int. Cl.[5] B05D *3/02*

U.S. Cl. 427—381 **5 Claims**

1. A process for producing a unidirectionally or multiaxially reinforced fiber composite by impregnating parallel reinforcing fibers with a solution of a thermoplastic polymer in an organic solvent, evaporating the solvent, and making up, which comprises employing the reinforcing fibers in the form of a woven fabric in which the parallel reinforcing fibers are held together by thermoplastic filament yarns and subsequently passing this woven fabric through a bath containing from 0 to 50% by weight of a thermoplastic and from 100 to 50% by weight of a solvent for the thermoplastic.

4,919,979

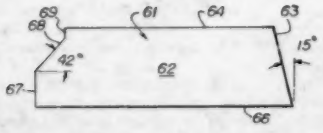
COMPACTED BALE

Peter Gardella, San Francisco, Calif., and Kevin L. Wood, West Linn, Oreg., assignors to Norcal Solid Waste Systems, Inc., San Francisco, Calif.

Division of Ser. No. 848,031, Apr. 3, 1986, Pat. No. 4,729,304. This application Aug. 14, 1987, Ser. No. 85,364

Int. Cl.[5] B30B *15/06, 15/32*

U.S. Cl. 428—2 **3 Claims**



1. A bale of compacted material of substantially rectangular transverse cross-section having parallel sides and parallel top and bottom, a forward end inclined upwardly-rearwardly and a rearward end have a vertical lower stretch extending upward from the bottom about half the height of said bale, an upwardly-forwardly inclined stretch above said lower stretch and a short vertical stretch above said inclined stretch.

4,919,980

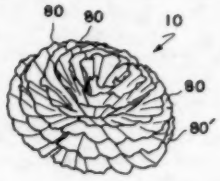
DECORATIVE ORNAMENT AND METHOD OF MAKING SAME

Arla Pirkey, 105 Bond St., Travis Air Force Base, Calif. 94535-1514

Filed Sep. 19, 1988, Ser. No. 245,678

Int. Cl.[5] D04D *7/10*

U.S. Cl. 428—4 **7 Claims**



1. A method of making a decorative ornament from an elongated continuous loop of sheet material, comprising;

(a) collapsing said elongated continuous loop of sheet material laterally to form a narrow continuous loop;

(b) imparting a 180 degree twist and coiling at least once said narrow continuous loop to form a plurality of coiled concentric loops;

(c) twisting said coiled concentric loops about a central point;

(d) affixing a tying member to affix said central point of said coiled concentric loops to a backing sheet; and

(e) cutting the distal ends of said coiled concentric loops to form a plurality of radially extending folds.

4,919,981

ARTIFICIAL HORTICULTURAL PRODUCT AIR FRESHENER

John Levey, and Idelle B. Levey, both of 4059 Mariner's Cir., Westlake Village, Calif. 91361

Filed Jul. 21, 1989, Ser. No. 383,855

Int. Cl.[5] A41G *1/00*; B65D *1/04*

U.S. Cl. 428—26 **12 Claims**

1. An artificial horticultural product air freshener combination comprising:

(a) a first outer vessel, said first vessel being in the form of a vase having a base portion from which upwardly and inwardly tapers a neck portion which neck portion defines an open passageway, said passageway having a predetermined diameter and open at its upper extremity;

(b) a second inner vessel, said second vessel being closed at its bottom and having a lower portion and an upper por-

tion, said second vessel being disposable within the first vessel and having an outer diameter for its upper portion which is less than said predetermined diameter of the passageway defined by the neck portion of said first vessel, said second vessel containing a volatile fluid, the vapor of which, when allowed to dissipate into the atmosphere, produces a desired olfactory effect, said second vessel having an opening at the top of its upper portion and a removable first closure for said opening;

(c) a second orificed closure to replace the first closure upon its removal;

(d) a decorative artificial horticultural product, said product including a sponge-like element, said element having an opening into its interior; and

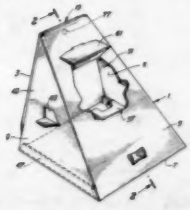
(e) an elongated wick, said wick being in a form simulating a plant or leaf stem, one end of said wick being removably insertable in said opening in said element and the other end of said wick being passed through the orifice in the second closure to extend down through the said opening in the second vessel and into contact with the fluid container therein.

4,919,982

THREE DIMENSIONAL TOY STRUCTURE

George K. C. Hayes, 2308 Schader Dr. #218, Santa Monica, Calif. 90404

Filed May 12, 1989, Ser. No. 351,089
Int. Cl.[5] B65D *5/00*
U.S. Cl. 428—34.2 11 Claims



1. A foldable structure in which children play comprising:

(a) a single blank having a plurality of score and reverse score lines for folding therealong to define foldable flaps,

(b) a bottom panel having a single thickness with first foldable flaps along score lines on either side such that when said flaps are folded onto said bottom panel they double the thickness of said panel,

(c) a rear panel having a single thickness with second foldable flaps along score and reverse score lines such that when said second flaps are folded onto said rear panel it will treble the thickness of said rear panel,

(d) a first tab extending from and foldable onto said rear panel to form a slot therein,

(e) a front panel naving a pair of side panels extending therefrom and foldable along score lines,

(f) a second tab extending from one end of said front panel and foldable along score lines,

(g) means for latching together the top edges of the front and rear panels by inserting said second tab into said slot,

(h) said single blank having an ornamental design such that when said front and rear panels are latched together, said side panels are folded to form a structure for a child to play inside.

4,919,983

THERMOCHROMATIC INFANT FEEDING CONTAINER

Kit C. Fremin, 25652 Ringgate #2G, El Toro, Calif. 92630

Filed Apr. 4, 1988, Ser. No. 177,144
Int. Cl.[5] A61J *9/02;* G01K *11/12*
U.S. Cl. 428—35.7 12 Claims

1. A thermochromatic infant feeding container changing color in the presence of heat comprising,

a cylindrically shaped container body formed by blow molding having an opening on one end with threads formed integrally therewith in such a manner as to receive a threaded cap,

said body synthesized of a thermoplastic material having the characteristics of allowing light to be transmitted therethrough permitting the level of any contents to be visually observed, and

said body having the thermoplastic material including a thermochromatic microcapsular composition relating to from 5 to 10 percent, by weight, of said thermoplastic material, formulated such that the container undergoes a distinct change in color at a temperature range from between 36 degrees celsius and 38 degrees celsius, with a first color below this thermochromatic transition and a second visually different color thereabove providing a conspicuous indication to one feeding an infant the temperature of the contents are not in excess of the human temperature zone of comfort.

4,919,984

MULTILAYER PLASTIC CONTAINER

Yoshitsugu Maruhashi; Tamio Asai; Setsuko Iida, all of Yokohama, and Sadao Hirata, Kamakura, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Continuation of Ser. No. 93,130, Sep. 2, 1987, abandoned, which is a continuation of Ser. No. 746,026, Jun. 18, 1985, abandoned. This application Oct. 7, 1988, Ser. No. 256,146
Claims priority, application Japan, Jun. 21, 1984, 59-126371; Apr. 30, 1985, 60-91128
Int. Cl.[5] B65D *81/26;* B32B *27/14*
U.S. Cl. 428—36.4 16 Claims

1. A multilayer plastic container for packaging formed of a coextruded laminate comprising a gas-barrier layer containing

an ethylene/vinyl alcohol copolymer and inner and outer surface layers of a moisture-resistant thermoplastic resin provided so as to sandwich the gas-barrier layer, said laminate further comprising intermediary layers between the gas-barrier layer and each of said moisture-resistant resin layers, each said intermediary layer containing from about 2 to 40% by weight, based on the total weight of said layer, of particles of cross-linked polyacrylic acid or its salt as a highly water-absorbing resin dispersed in a thermoformable thermoplastic resin medium wherein the highly water-absorbing resin is essentially water-insoluble and has the ability to absorb 20 to 1000 times its own weight of water.

4,919,985

COATED STYRENE RESIN CONTAINER AND PROCESS FOR PRODUCTION THEREOF

Tamio Asai, and Yoshitsugu Maruhashi, both of Yokohama, Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

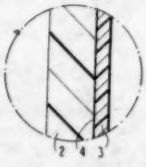
PCT No. PCT/JP88/00041, § 371 Date Sep. 22, 1988, § 102(e) Date Sep. 22, 1988, PCT Pub. No. WO88/05409, PCT Pub. Date Jul. 28, 1988

PCT Filed Jan. 21, 1988, Ser. No. 294,637

Claims priority, application Japan, Jan. 22, 1988, 62-11243

Int. Cl.[5] B65D *23/08*; B05D *3/00*

U.S. Cl. 428—36.6 **6 Claims**



1. A coated styrene resin container comprising a container body composed of a styrene resin and having applied to at least one surface of the container body, a coated layer of a vinylidene chloride resin, the vinylidene chloride resin coated layer being composed of a copolymer containing 96 to 70 mole % of vinylidene chloride units, 3 to 30 mole % of vinyl chloride units and 3 to 20 mole % of lower alkyl acrylate or methacrylate units based on the three components, and the coated layer being intimately bonded to the container body via a layer of an oxidation product of the styrene resin which has O_{1S} peaks at a bond energy of 532.5 to 533.6 eV when measured by X-ray photoelectron spectroscopy.

4,919,986

PLASTIC SUCTION CUP ARRANGEMENT FOR LAMINATD GLASS PANE REPAIR

Kurt Lay, and Erwin Sailer, Alfdorf, both of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Fed. Rep. of Germany

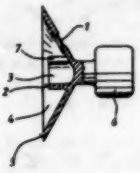
Filed Jun. 9, 1989, Ser. No. 363,714

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1988, 3819622

Int. Cl.[5] F16B *47/00*

U.S. Cl. 428—43 **4 Claims**

1. A plastic suction cup made of a flexible transparent material which can be placed in a sealing manner on a glass pane and, in a vacuum-tight manner, can be pierced with a hollow needle for pane repair operations and the like, wherein a wall of the plastic suction cup has a spot which is thinner than its remaining wall thickness for accomodating the piercing by the hollow needle, and wherein a collecting pocket is provided in the interior of the plastic suction cup which can be reached by the hollow needle, which collecting pocket is open in the same direction as the suction cup itself and the front edge of which collecting pocket is set back with respect to a contact edge of the plastic suction cup and which, at its circumference, has an



opening pointing to the thin spot for the passage of the hollow needle.

4,919,987

PROCESS FOR THE JOINING OF POLYAMIDE PARTS BY FRICTION WELDING

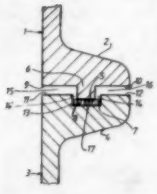
Walter Maaner, Garmisch-Partenkirchen, Fed. Rep. of Germany, assignor to Verwaltungsgesellschafft Geiger Plastic GmbH & Co. KG, Garmisch-Partenkirchen, Fed. Rep. of Germany

Filed Jan. 14, 1988, Ser. No. 143,934

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1987, 3700981

Int. Cl.[5] B29C *65/06*

U.S. Cl. 428—60 **6 Claims**



4. A friction welded joint structure produced by:

providing a first polyamide piece, said first polyamide piece containing a groove having a bottom weld surface;

providing a second piece, said second polyamide piece having a tongue portion;

introducing a plastic or elastic material into said groove between said bottom weld surface and a lower weld surface on said tongue portion;

bringing said lower weld surface of said tongue portion of said seond polyamide piece into contact with said bottom weld surface of said groove all remaining paired opposing surfaces of said first and second polyamide pieces being spaced apart from each other thereby creating gaps, said elastic or plastic material being forced from between said bottom weld surface of said groove and said lower weld surface tongue portion and into said gaps;

imparting a rotary or oscillating movement to said second polyamide piece;

capturing turnings produced by said rotary or oscillating movement in said elastic or plastic material previously displaced into said gaps; and

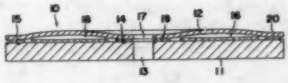
bonding said lower weld surface of said tongue portion of said second polyamide piece to said bottom weld surface of said groove of said first polyamide piece by continued rotary or oscillating movement of said second polyamide piece.

4,919,988

INFORMATION RECORDING MEDIUM AND PROCESS FOR PRODUCING THE SAME

Toshiyuki Masuda, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigari, Japan

Filed Mar. 28, 1988, Ser. No. 173,814
Claims priority, application Japan, Mar. 26, 1987, 62-72764; Apr. 6, 1987, 62-84114
Int. Cl.[5] B32B 3/02
U.S. Cl. 428—64 8 Claims



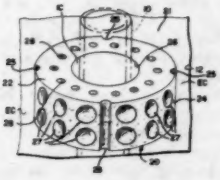
1. An information recording medium having such a structure that a disc-shaped substrate is provided with a hole at its central part, an inner-side non-recording zone is provided around the periphery of said hole, an outer-side non-recording zone is provided inside the outer periphery of the substrate, a recording zone is provided between both non-recording zones on the substrate, and flexible disc-shaped resin film having a hole at its central part is joined to each of the non-recording zones on the substrate in such a state that the resin film is spaced away from and does not contact the recording zone on the substrate to form a gas layer over the recording zone.

4,919,989

ARTICLE FOR SEALING WELL CASTINGS IN THE EARTH

Robert V. Colangelo, Chicago, Ill., assignor to American Colloid Company, Arlington Heights, Ill.

Filed Apr. 10, 1989, Ser. No. 335,808
Int. Cl.[5] E21B 43/00
U.S. Cl. 428—65 22 Claims



1. An article of manufacture for sealing around an elongated casing extending into a borehole in the earth; comprising:

an annular disk formed of relatively dry, compacted, liquid-swellable and absorbent, material including bentonite, said disk having a pair of generally flat, spaced apart, opposite faces and a central hole extended through said disk between said opposite faces, said hole having a cross-section greater than that of said casing, to permit said disk to be mounted on and move along said casing in guided, generally centered position thereon into said borehole;

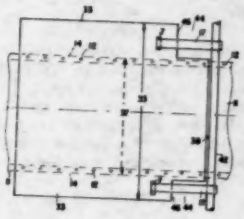
said disk having an outer periphery spaced radially outwardly around said central hole extending between said opposite faces outwardly of and smaller than said borehole for permitting said disk to move along said casing to form a stack of said disks thereon for substantially filling said borehole around said casing.

4,919,990

PAPER BUSTER

Gregory E. Davis, 2010 Holt Ave., #3, Los Angeles, Calif. 90034

Filed Jul. 27, 1988, Ser. No. 224,807
Int. Cl.[5] B32B 3/06; B42F 3/00
U.S. Cl. 428—100 2 Claims



1. In association with a computer printer designed to use paper having spaced perforations along its side edges, wherein said printer has a horizontal paper in-feed surface, and a paper drive mechanism that includes movable lugs adpated to engage the perforations in the paper to return the outgoing paper back toward the incoming paper; said printer further comprising a crossbar in near adjacency to the drive mechanism above the paper in-feed surface, the improvement comprising means for separating the outgoing paper from the incoming paper, said separating means including a flexible sheet that is wider than the paper; said separating sheet extending over the incoming paper and underneath the outgoing paper, with its downstream edge in near abutment to the printer crossbar; said sheet having its downstream corners cut away to form shoulder edges spaced upstream from the crossbar; and two laterally spaced attachment straps connected to said sheet near its side edges, said straps extend around the crossbar; said straps having mating ends that can be disengaged from each other to install or remove the flexible sheet.

4,919,991

HYBRID CERAMIC MATRIX COMPOSITE ARTICLES COMPRISING PARTICULATE ADDITIVES AND METHOD

Kishor P. Gadkaree, Big Flats, N.Y., assignor to Corning Incorporated, Corning, N.Y.

Filed May 23, 1988, Ser. No. 197,296
Int. Cl.[5] C03C 10/06, 10/08, 14/00; B32D 18/00
U.S. Cl. 428—113 11 Claims

1. A laminar ceramic matrix composite article comprising:

(a) a matrix consisting essentially of a ceramic material selected from the group consisting of alkaline earth aluminosilicate glasses and alkaline earth aluminosilicate glass-ceramics;

(b) inorganic reinforcing fibers disposed in multiple layers in the matrix, said layers comprising fiber arrays wherein the fibers are disposed in substantially parallel alignment; and

(c) a particulate additive dispersed in the matrix, said additive comprising particles having aspect ratios below 2:1

and an average particle size of at least about one micron, and said additive being present in a proportion at least effective to increase the interlaminar shear strength, transverse flexural strength, or fracture toughness of the article, but not exceeding about 10% by weight of the combined weight of the particulate additive and alkaline earth aluminosilicate ceramic matrix.

4,919,992

PROCESS FOR MAKING MICROPOROUS PRODUCTS AND THE PRODUCTS THEREOF

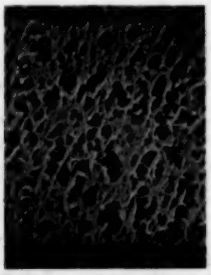
David J. Blundell, Middlesbrough; Frederic N. Cogswell, and Peter J. Meakin, both of Guisborough, all of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Jul. 1, 1988, Ser. No. 214,391

Claims priority, application United Kingdom, Jul. 2, 1987, 8715530

Int. Cl.[5] B32B *3/26, 31/00*

U.S. Cl. 428—131 19 Claims



1. A process of producing an open cell structure network from a semicrystalline, melt crystallisable polyarylene ether or polyarylene thioether comprising providing a molten mixture of at least one such semicrystalline polymer in the presence of a melt plasticiser for the polymer which melt contains at least some polymer entities having a crystalline form, the total polymer concentration being between 5 and 50% by weight of the mixture of polymer and melt plasticiser and heating the mixture of polymer and melt plasticiser at a heating rate of between 1° C. and 1000° C./hour, until the mixture is at a temperature in the range 10° C. below to 20° C. above its clearing point and cooling the mixture until it solidifies, whereby an open cell structure essentially free from granular superstructure is obtained.

4,919,993

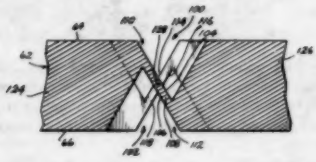
FLEXURES AND METHOD FOR CREATING FLEXURES IN A WAFER

James R. Woodruff, Redmond, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Feb. 27, 1989, Ser. No. 317,159

Int. Cl.[5] H01L *21/306;* B44C *1/22*

U.S. Cl. 428—134 11 Claims



1. In a sensor fabricated from a wafer having upper and lower surfaces, the sensor comprising a first member pivotally connected to a second member, the improvement comprising first and second flexures connecting the first member to the second member, the flexures permitting rotation of the second member with respect to the first member about a common hinge axis, the first flexure being connected to the first member at a position closer to the upper than to the lower surface of the wafer and being connected to the second member at a position closer to the lower than to the upper surface of the wafer, the second flexure being connected to the first member at a position closer to the lower than to the upper surface of the wafer and being connected to the second member at a position closer to the upper than to the lower surface of the wafer.

4,919,994

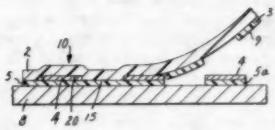
DRY TRANSFER GRAPHICS ARTICLE AND METHODS OF PREPARATION AND USE THEREOF

Joseph H. Incremona, Stillwater, and Richard H. Lundeen, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 846,755, Apr. 1, 1986, abandoned. This application Mar. 20, 1987, Ser. No. 25,117

Int. Cl.[5] B41M *5/00*

U.S. Cl. 428—141 22 Claims



1. A dry transfer article for application to a substrate to provide a design thereon comprising:

(1) a continuous carrier film presenting a major surface having first and second surface portions thereon;

(2) a graphic pattern in the shape of said design, said graphic pattern comprising at least one layer and being clingingly bonded to said first surface portions of said major of said carrier film; and

(3) at least one continuous adhesive layer having first segments covering said graphic pattern and bonded thereto, and second segments covering said second surface portions of said major surface of said carrier and bonded thereto;

said major surface of said carrier film exhibiting sufficiently high compatibility with said adhesive to provide a strong bond therebetween;

said major surface of said carrier film exhibiting sufficiently low compatibiity with said graphic pattern to provide at most a clinging bond therebetween;

said graphic pattern having been formed from at least one layer of an imaging material applied to said adhesive before said carrier was contacted thereto;

wherein the work to fracture of said adhesive layer is sufficiently low that, upon application of a peel force to said carrier, said adhesive will preferentially fracture according to the edges of said graphic pattern while the bond between said second segments of said adhesive and said second surface portions of the carrier and the bond between said first segments of said adhesive and said graphic pattern will remain intact; and

wherein said major surface of said carrier film is primed with at least one of the following: bohmite, sputter etch, oxygen plasma treatment, or modified sol gel, such that said major surface is capable of providing an adhesive bond to said second segments of said adhesive layer which is greater than the applied adhesive bond between said adhesive layer and said substrate;

whereby, upon adhering said article to said substrate, application of a peel force to said carrier film allows selective

separation from said substrate of said carrier film together with said second segments of said adhesive along the edge of said graphic pattern, leaving on said substrate said graphic pattern, and said first segments of said adhesive in registry therewith.

4,919,995

HEAT-INSULATING DEVICE COMPRISING RADIATION-REFLECTING MATERIALS AND A CONDUCTION-INSULATING MATERIAL

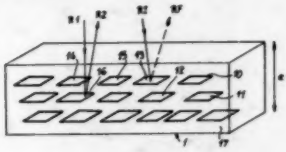
Claude Joly, Puteaux, France, assignor to Bronzavia Aeronautique, Nanterre, France

Filed Feb. 9, 1988, Ser. No. 154,044

Claims priority, application France, Feb. 13, 1987, 87 01866

Int. Cl.[5] B32B *3/22, 5/16;* B64C *1/40;* F16L *59/08*

U.S. Cl. 428—189 **14 Claims**



1. A light-weight, heat-insulation device for aeronautical use which protects a surface from an incident radiation with efficiency at temperatures in the range of at least 800° C., consisting of:

a conduction-insulating material, and

a plurality of reflecting flakes inserted into and distributed through the conduction-insulating material, the plurality of reflecting flakes being juxtaposed and overlapping each other so as to conceal the surface from the incident radiation.

4,919,996

FILMS AND TAPES

Colin A. Dewar, Hucclecote, and Kevin J. Artus, Barnwood, both of United Kingdom, assignors to Imperial Chemical Industries PLC, London, England

Filed Mar. 11, 1988, Ser. No. 167,160

Int. Cl.[5] D03D *3/00*

U.S. Cl. 428—221 **3 Claims**

1. A method of producing a film or tape characterised in that a blend of from 30 to 70 parts by weight of a first thermoplastic fibre-forming polymeric component and from 70 to 30 parts by weight of a second, immiscible, thermoplastic fibre-forming polymeric component is spun into a film or tape wherein each component is present in the film or tape as fibrils which are substantially aligned to the longitudinal axis of the film or tape, such aligned fibrils of one polymeric component being interconnected to each other in a random manner, such interconnections penetrating through the fibrils of the other polymeric component such that both components exist in the film or tape as interpenetrating networks and then, using a solvent for the second polymeric component, leaching away from the film or tape the second fibre-forming polymer leaving a low density, porous film or tape of the first fibre-forming polymer.

4,919,997

MELT-BLOWN WATER-ABSORBING TISSUES AND MATTS

Ian C. Twilley, Chester, and Robert A. Lofquist, Richmond, both of Va., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

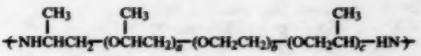
Filed Nov. 6, 1987, Ser. No. 117,790

Int. Cl.[5] B32B *17/00;* D01G *3/00;* D03D *3/00*

U.S. Cl. 428—227 **7 Claims**

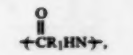
1. A melt-blown water-absorbing matt of fibers comprising a block copolyetheramide having a number average molecular weight of from about 10,000 to about 35,000 and having polymer segments of the following structure:

(A) a polyether segment consisting predominantly of

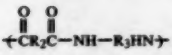


where c is at least 1, (a+c) is at least 1 but less than 10 and b is at least 10 but less than 150;

(B) a polyamide segment consisting of at least one of the following:



(1)



(2)

where R_1, R_2 and R_3 are each selected from the same or different alkylene or substituted alkylene moieties of from 4 to 11 carbons and difunctional aromatic moieties; wherein the concentration of segment A in the copolymer is between from about 10 to about 50 percent by weight of copolyether amide.

4,919,998

WOVEN MEDICAL FABRIC

Conrad D. Goad, Greensboro, N.C., and Jeffrey L. Taylor, Cincinnati, Ohio, assignors to Precision Fabrics Group, Greensboro, N.C. and Standard Textile Co., Inc., Cincinnati, Ohio

Continuation of Ser. No. 293,462, Jan. 4, 1989, abandoned, which is a continuation-in-part of Ser. No. 164,197, Mar. 4, 1988, Pat. No. 4,822,667. This application Sep. 14, 1989, Ser. No. 407,705

Int. Cl.[5] B32B *7/00*

U.S. Cl. 428—265 **10 Claims**

1. A process of imparting water-resistent, flame-resistant, low linting and antimicrobial properties to a tightly woven medical fabric comprising the steps of:

(1) applying to a woven polyester fabric, constructed from polyester yarn of about 50 to about 150 denier with the sum of ends and picks of at least 100 per linear inch, an aqueous finish composition containing a fluorocarbon water repellent, a flame retardant, and an antimicrobial agent, and

(2) drying the fabric,

the resulting medical fabric having the following properties initially and following 100 laundering cycles:

	Initial	After 100 Cycles
linting (INDA 160-0-83) particles	at most 5,000	at most 2,000

-continued

	Initial	After 100 Cycles
flammability (NFPA 702)	Class II	Class II
antimicrobial activity (CTM-0923) for *Klebsiella pneumoniae*	no growth	no growth
Suter hydrostatic resistance (AATCC-127) centimeters	at least 20.0	at least 10.0
spray rating (AATCC-22-1980)	at least 70.0	at least 50.0
air permeability (FTM 5450, Frazier method)	at most 20	at most 20

4,919,999

WELDABLE MICROPOROUS NON-WOVEN TAPE FOR MEDICAL APPLICATIONS

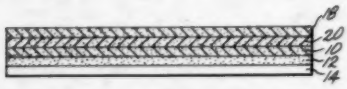
Petrus L. A. Maria Van Soom, Vosselaar, Belgium, assignor to Avery International Corporation, Pasadena, Calif.

Filed May 20, 1988, Ser. No. 197,032

Claims priority, application Netherlands, May 22, 1987, 8701228

Int. Cl.[5] C09J 7/02

U.S. Cl. 428—284 15 Claims



1. A laminated product comprising a porous, woven or non-woven web of paper, synthetic or natural fibers, said web having on one surface thereof a porous pressure sensitive adhesive coating layer and said web providing at the surface opposed to the adhesive coating a thermoplastic material which is weldable to another thermoplastic material said laminated product having a moisture vapor transmission rate of at least 150 $g/m^2/24$ hr at 37° C. while withstanding a hydrostatic column of a 0.9% $NaCl-H_2O$ solution of 11.5 cm height for at least 20 seconds without leakage.

4,920,000

BLEND OF COTTON, NYLON AND HEAT-RESISTANT FIBERS

James R. Green, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 343,391, Apr. 28, 1989. This application Jun. 29, 1989, Ser. No. 371,578

Int. Cl.[5] D04H 1/58

U.S. Cl. 428—288 9 Claims

1. An intimate blend of staple fiber comprising 5–20% nylon staple fibers, 15–50% of heat resistant fibers which have a Heat Resistance Time of at least 0.018 $sec/g/m^2$ and a Limiting Oxygen Index of at least 25 and at least 30% of cotton fibers.

4,920,001

POINT-BONDED JET-SOFTENED POLYETHYLENE FILM-FIBRIL SHEET

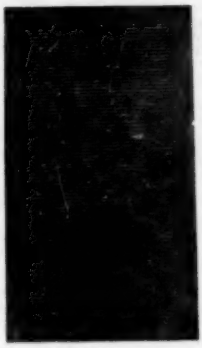
Chi-Chang Lee, Richmond, Va., and Penny C. Simpson, Derwood, Md., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 259,224, Oct. 18, 1988. This application Jul. 24, 1989, Ser. No. 367,353

Int. Cl.[5] D04H 1/58

U.S. Cl. 428—289 3 Claims

1. A process for preparing a dyed nonwoven fabric that is particularly useful in a disposable protective garment of the type worn by asbestos workers comprising forming an aqueous mixture of a disperse dye and a hydrophilic finish and contacting the nonwoven fabric produced by passing a lightly consolidated, flash-spun polyethylene plexifilamentary film-fibril sheet having a unit weight in the range of 25 to 50 grams per square meter through two successive nips, each nip being formed between two rolls, one of which is a heated metal roll having hard bosses on its surface and the other roll having a resilient surface the Shore A durometer hardness of which is in the range of 60 to 70, the heated metal roll of the first nip contacting one surface of the sheet and the heated roll of the second nip contacting the other surface of the sheet, the bosses of the heated metal rolls forming a repeating regular polygon pattern in which the bosses are spaced in the range of from 4.8 to 7.1 bosses per centimeter and number in the range of 29 to



62 bosses per square centimeter, the bosses having a height that is in the range of 1.2 to 1.8 times the thickness of the sheet being contacted and having a total cross-sectional area at their tips equal to about 4 to 7 percent of the sheet area being treated, the bosses of the second nip being out of register with the bosses of the first nip, each nip applying a load in the range of 9 to 21 kilograms per centimeter of width to the sheet, to form a point-bonded sheet that is then subjected to high energy jets of water supplied from multiple closely spaced orifices having diameters in the range of 0.08 to 0.18 mm to impart to the sheet an energy-impact product in the range of 0.26 to 0.8 megaJoule-newtons per kilogram with the mixture and drying the fabric.

4,920,002

COLORED AND WEAR-RESISTANT DECORATIVE COATING BASED ON EPOXY RESIN AND FOR USE ON FLOORS AND ON PANELS, AND METHOD OF OBTAINING IT

Christian Cussot, Cleres, and Jean-Didier Delage, Sartrouville, both of France, assignors to Societe Francaise Bitumastic, Petit Quevilly, France

Filed Jun. 24, 1988, Ser. No. 210,835

Claims priority, application France, Jun. 26, 1987, 87 09016

Int. Cl.[5] B32B 18/00

U.S. Cl. 428—325 11 Claims

1. A colored, wear-resistant, decorative coating based on epoxy resin applied to a substrate, wherein the coating is constituted by a uniform mixture including solvent-free epoxy resin, solid glass microbeads and pigment-colored aluminum flakes, said coating thus being bulk-pigmented, translucent, and glittering in a durable manner.

4,920,003

DI-TRIDECYL SEBACATE TIRE YARN FINISH

Fleming H. Day, Greenville, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 15, 1987, Ser. No. 73,531
Int. Cl.[5] B32B 9/00; D02G 3/02
U.S. Cl. 428—391 6 Claims

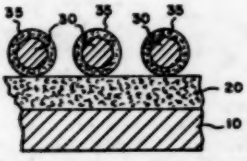
1. A fiber finish especially suitable for tire yarns comprising 50–95 wt. % of the finish being lubricants having a melting point not greater than about 12° C. wherein at least 40 wt. % of the lubricants is ditridecyl sebacate, 5–50 wt. % of the finish being a total antistat and surfactant, 0–5 wt. % of the finish being antioxidant and 0–2 wt. % of the finish being a polysiloxane.

4,920,004

GELATIN-GRAFTED POLYMER PARTICLES

Pranab Bagchi, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 98,245, Sep. 28, 1987, abandoned. This application Feb. 7, 1989, Ser. No. 307,393
The portion of the term of this patent subsequent to Aug. 8, 2006, has been disclaimed.
Int. Cl.[5] B32B 42/02
U.S. Cl. 428—407 5 Claims



1. A particle comprising polymer core having a mean diameter of from about 10 to 10^6 nm covered with a gelatin shell about 10 to 60 nm thick, said gelatin being covalently bonded to the said polymer core.

4,920,005

AROMATIC POLYMER COMPOSITIONS

Frank Mercer, Belmont, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Division of Ser. No. 7,295, Jan. 27, 1987, Pat. No. 4,835,197, which is a continuation-in-part of Ser. No. 815,523, Dec. 31, 1985, abandoned, which is a continuation-in-part of Ser. No. 688,794, Jan. 24, 1985, abandoned. This application May 23, 1989, Ser. No. 355,937
Int. Cl.[5] B32B 27/34, 27/36, 27/06
U.S. Cl. 428—411.1 26 Claims

1. An article comprising a substrate having on a surface thereof at least one layer of a curable composition comprising:

(a) a first component comprising an aromatic polymer having a first preponderant repeat unit selected from the group consisting of
(i) poly(sulfone)
(ii) poly(aryl ether ketone)
(iii) poly(carbonate)
(iv) poly(arylate)
(v) poly(imide)
(vi) poly(benzimidozopyrolone), and
(v) poly(imide isoindoquinazolinedione), said aromatic polymer being substantially free of acetylene, maleimide, or vinyl terminal groups, and

(b) a second component comprising an acetylene, maleimide, or vinyl terminated poly(imide) or poly(isoimide) or precursor thereof, which second component is compatible with the first component, has 1 to 300 second preponderant repeat units which are different from the first preponderant repeat units, is substantially free of elemental sulfur and reactive divalent sulfur, and is present in an amount effective to substantially cure the composition to a gel content of at least about 10%, as measured by percent insolubles in chloroform.

4,920,006

COLORED METAL ALLOY/OXYNITRIDE COATINGS

Frank H. Gillery, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 26, 1987, Ser. No. 31,315
Int. Cl.[5] B32B 15/00
U.S. Cl. 428—432 10 Claims

1. An article of manufacture comprising:

a. a transparent substrate;

b. a titanium oxynitride film deposited on one surface of said substrate of sufficient thickness to produce a colored reflectance from the uncoated surface of said substrate; and

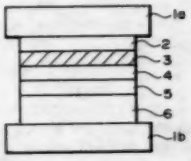
c. deposited on said titanium oxynitride film and as the exposed layer of a multilayer coating a metal film which controls the transmittance of said article.

4,920,007

MAGNETO-OPTICAL RECORDING MEDIUM WITH 9:1–1:9 ALUMINUM OR SILICON OXIDE AND ALUMINUM OR SILICON NITRIDE MIXTURE

Mitsuharu Sawamura; Kazuoki Hongu, both of Yokohama, and Kazuhiko Kikuchi, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 32,998, Mar. 30, 1987, abandoned, which is a continuation of Ser. No. 688,430, Jan. 2, 1985, abandoned. This application Sep. 12, 1988, Ser. No. 244,541
Claims priority, application Japan, Jan. 10, 1984, 59-1486
Int. Cl.[5] B32B 15/04; G11B 5/66
U.S. Cl. 428—457 9 Claims



1. A magneto-optical recording medium, comprising:

a magneto-optical recording layer; and

a mixture film formed on at least one side of said magneto-optical recording layer, said mixture film comprising a mixture layer of aluminum oxide or silicon oxide and aluminum nitride or silicon nitride wherein the weight ratio of the nitride to the oxide in the mixture film is between about 1:9 to 9:1.

4,920,008

POWDER COATING COMPOSITIONS

Robert B. Barbee, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

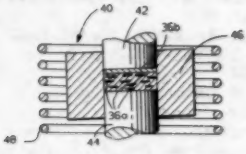
Filed Mar. 20, 1989, Ser. No. 325,847
Int. Cl.[5] C08L 67/02; B32B 15/08
U.S. Cl. 428—458 21 Claims

9. A thermosetting coating composition according to claim 7 containing about 15 to 25 weight percent, based on the total weight of the amorphous polyester, the polyether-ester and the blocked polyisocyanate, of a blocked polyisocyanate.

4,920,009
METHOD FOR PRODUCING LAMINATED BODIES COMPRISING AN RE-FE-B TYPE MAGNETIC LAYER AND A METAL BACKING LAYER

Robert W. Lee, Troy, and Earl G. Brewer, Warren, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 5, 1988, Ser. No. 233,699
Int. Cl.[5] B22F 3/00
U.S. Cl. 428—552 20 Claims



1. A method of making a laminated magnetic article comprising a magnetic layer comprising iron, neodymium and/or praseodymium, and boron and a supportive metal layer bonded to the magnetic layer, said method comprising:

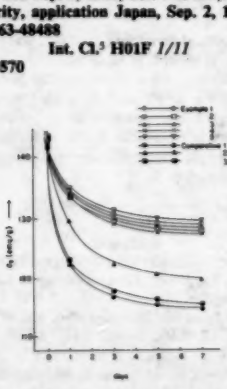
providing particulate material that is magnetically isotropic and characterized by a microstructure that is either amorphous material or of generally spherical crystal grains of an average size no greater than about 500 nm; and of a composition comprising a transition metal (TM) taken from the group consisting of iron and mixtures of iron and cobalt, one or more rare earth metals (RE) including neodymium and praseodymium, and boron, the proportions of such constituents being sufficient to form a product that upon crystallization consists essentially of the tetragonal crystalline compound having the empirical formula $RE_2TM_{14}B$;

hot pressing a layer of the particulate material against a layer of chemically compatable, different metal composition at a temperature and pressure to consolidate the particulate layer into a fully densified layer and to bond it to the metal backing to produce a resultant layer of magnetic material on a metallic backing.

4,920,010
FERROMAGNETIC METAL POWDER

Yasuo Kadono; Masaaki Koga, and Yoshio Aoki, all of Wakayama, Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Sep. 2, 1988, Ser. No. 239,752
Claims priority, application Japan, Sep. 2, 1987, 62-219784; Mar. 1, 1988, 63-48488
Int. Cl.[5] H01F 1/11
U.S. Cl. 428—570 4 Claims

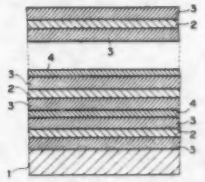


1. A ferromagnetic metal powder comprising a ferromagnetic metal particle composed mainly of iron, a silicon compound layer formed on the surface of the ferromagnetic metal particle in such an amount that the amount of silicon is 0.1 to 1% by weight based on the weight of iron in the ferromagnetic metal particle, and a layer containing a nonferrous transition metal element compound in an amount of from 2 to 15% by weight based on the weight of iron in said ferromagnetic particle, which is formed on the silicon compound layer.

4,920,011
MAGNETIC FIELD SHIELD INCLUDING A SUPERCONDUCTIVE FILM

Souichi Ogawa, Hyogo; Takao Sugioka, and Masaru Inoue, both of Osaka, all of Japan, assignors to Osaka Prefecture and Koatsu Gas Kogyo Co. Ltd., both of Osaka, Japan

Filed Oct. 20, 1988, Ser. No. 260,604
Claims priority, application Japan, Feb. 9, 1988, 63-28174; Aug. 10, 1988, 63-200795
Int. Cl.[5] H05K 9/00
U.S. Cl. 428—596 6 Claims



4. A magnetic field shield including a superconductive film wherein said magnetic field shield comprises:

a metal substrate of copper, aluminum, nickel, stainless steel, titanium, niobium or niobium-titanium alloy; and

a plurality of laminated sandwiches each of which consists essentially of a niobium-titanium alloy layer, a superconductive film layer consisting essentially of a mixed crystalline body of niobium nitride and titanium nitride;

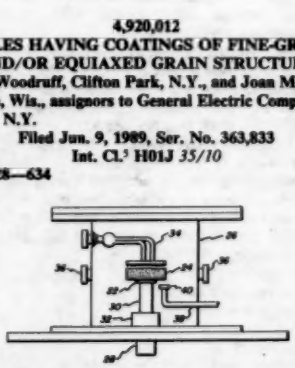
another niobium-titanium alloy layer; and a metal layer in that order;

wherein the upmost sandwich layer does not include said metal layer.

4,920,012
ARTICLES HAVING COATINGS OF FINE-GRAINED AND/OR EQUIAXED GRAIN STRUCTURE

David W. Woodruff, Clifton Park, N.Y., and Joan M. Redwing, Madison, Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 9, 1989, Ser. No. 363,833
Int. Cl.[5] H01J 35/10
U.S. Cl. 428—634 9 Claims

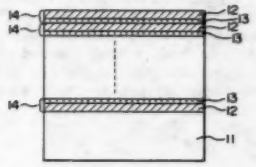


1. An article comprising a substrate, a diffusion barrier of rhenium directly bonded thereto and a coating of tungsten or a tungsten-rhenium combination directly bonded to said diffusion barrier, said coating being free from columnar grain structure and having an average grain size in the range of about 400–10,000 Angstroms.

4,920,013
MAGNETIC MULTILAYER STRUCTURE

Toshio Kobayashi, Tokyo; Shigekazu Otomo, Sayama; Ryoichi Nakatani, Akigawa, and Noriyuki Kumasaka, Ome, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 23, 1987, Ser. No. 100,231
Claims priority, application Japan, Sep. 24, 1986, 61-223704
Int. Cl.[5] B32B 9/00; G11B 5/66
U.S. Cl. 428—694 9 Claims



1. A magnetic multilayer structure having an increased permeability and an increased saturation magnetic flux density, the structure comprising a plurality of magnetic layers and a plurality of intermediate layers, each of said intermediate layers being formed between adjacent two of said magnetic layers, wherein

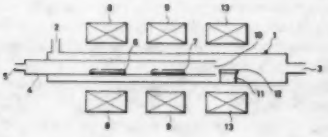
each of said magnetic layers is crystalline and is made of a magnetic material selected from the group consisting of Fe, Co, Ni and an alloy containing as its main component at least one of said elements, Fe, Co and Ni, and

each of said intermediate layers is made of a material which forms an interstitial solid solution with said material of said magnetic layers.

4,920,014
ZIRCONIA FILM AND PROCESS FOR PREPARING IT

Toshio Hirai, Izumi, and Hisanori Yamane, Sendai, both of Japan, assignors to Sumitomo Metal Mining Co., Ltd., Tokyo, Japan

Filed Feb. 26, 1988, Ser. No. 161,101
Claims priority, application Japan, Feb. 27, 1987, 62-44687; Feb. 27, 1987, 62-44688; Feb. 27, 1987, 62-44689; Sep. 18, 1987, 62-235896
Int. Cl.[5] C03C 17/25, 18/12
U.S. Cl. 428—698 6 Claims



1. A zirconia film, comprising:

a zirconia film formed on a substrate, said film having substantially only one or two kinds of particular crystal planes oriented parallel to the surface of said substrate.

4,920,015
ELECTROCHEMICAL H_2S CONVERSION

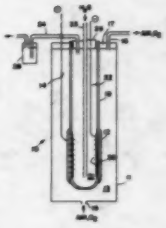
Anthony F. Sammells, Naperville, Ill., assignor to Gas Research Institute, Chicago, Ill.

Filed Sep. 29, 1988, Ser. No. 250,940
Int. Cl.[5] H01H 8/06
U.S. Cl. 429—17 29 Claims

1. A process for electrochemical H_2S conversion comprising:

passing H_2S containing gas in contact with an electrocatalytic anode comprising an $A_{1+x}B_{2-x}S_4$ thiospinel wherein A and B are metallic, $0<X<0.2$ and S is sulfur, thermally stable at cell operating temperatures of about 650° to about 1050° C.;

passing O_2 containing gas in contact with a cathode comprising strontium doped lanthanum manganite forming ionic oxygen;



passing said ionic oxygen from said cathode through an adjacent solid oxygen ion conducting electrolyte to said anode adjacent an opposite side of said solid electrolyte;

oxidizing said H_2S to S and H_2O at said electrocatalytic anode.

4,920,016
LIPOSOMES WITH ENHANCED CIRCULATION TIME

Theresa M. Allen, Edmonton, Canada, and Alberto Gabizon, San Francisco, Calif., assignors to Linear Technology, Inc., Menlo Park, Calif.

Continuation-in-part of Ser. No. 946,415, Dec. 24, 1986, abandoned. This application Dec. 18, 1987, Ser. No. 132,136
Int. Cl.[5] A61K 37/22, 9/66; B01J 13/02
U.S. Cl. 424—450 11 Claims

1. A composition comprising liposomes which contain an entrapped pharmaceutical agent and are characterized by:

(a) liposome sizes predominantly between about 0.05 and 0.5 microns,

(b) liposomes having substantially homogeneous-phase bilayers composed at at least about 50 mole percent of a membrane-rigidifying lipid selected from the group consisting of sphingomyelin and neutral phospholipids with predominantly saturated acyl chains, and

(c) between about 5–20 mole percent saturated phosphatidylinositol.

5. In a therapeutic drug treatment in which a drug is administered intravenously in a suspension of liposomes in which the drug is entrapped and whose sizes are predominantly between about 0.05–0.5 microns, a method of extending the lifetime of liposomes in the bloodstream which comprises preparing the liposomes to contain:

(a) substantially homogeneous-phase bilayers containing at least about 50 mole percent of a membrane-rigidifying lipid selected from the group consisting of sphingomyelin and neutral phospholipids with predominantly saturated acyl chains, and

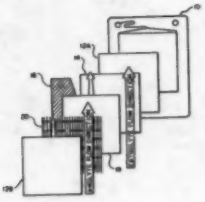
(b) between about 5–20 mole percent saturated phosphatidylinositol.

4,920,017

POROUS AND POROUS-NONPOROUS COMPOSITES FOR BATTERY ELECTRODES

Calman Herscovici, Chappaqua, N.Y., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Division of Ser. No. 934,168, Nov. 20, 1986, Pat. No. 4,818,741.
This application Nov. 23, 1988, Ser. No. 275,219
Int. Cl.[5] H01M *4/86*; B01J *21/18*
U.S. Cl. 429—42 **5 Claims**



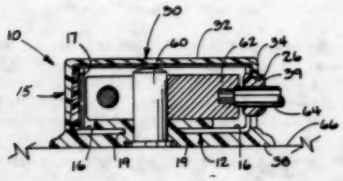
1. In a zinc-bromide electrochemical cell, the improvement comprising a cathode element comprising a pressure-molded porous composite comprising electrically conductive particulate carbon selected from the group consisting of carbon black, graphite and mixtures thereof having a particle size distribution of 0 to 45μm and a thermoplastic resin, said carbon and said resin being in a weight ratio from about 1:5 to 1:1; said composite characterized by 80–95% porosity by volume and a pore size diameter distribution from about 5 microns to about 200 microns.

4,920,018

BATTERY TERMINAL SEAL

William C. Turner, 1020 N. 23rd St., Coeur d'Alene, Id. 83814

Filed Jun. 28, 1989, Ser. No. 373,109
Int. Cl.[5] H01M *2/00*
U.S. Cl. 429—65 **17 Claims**



1. A cover for a battery terminal and connector with a cable extending therefrom, the cover comprising:

a pair of base sections each including a terminal receiving recess therein;

connector means joining the base sections for movement between open positions wherein the base sections are separated and closed positions wherein the base sections are positioned adjacent one another to form a base plate with the terminal receiving recesses forming a terminal receiving opening;

a cap receivable over the base plate, adapted to cover the battery terminal cover;

a side wall extending between the cap and base plate, forming an enclosure with the base and cap, the enclosure being adapted to receive a battery terminal and connector;

the side wall including a cable receiving receiving opening adapted to receive a battery cable;

a first flexible seal for substantially sealing the terminal receiving opening about the terminal; and

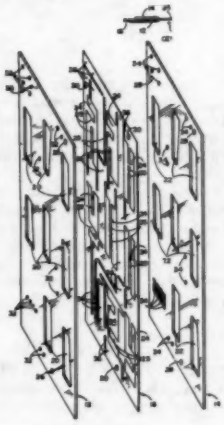
a second flexible seal for sealing the battery cable opening about the battery cable.

4,920,019

BATTERY PACK ASSEMBLY HAVING A CIRCUIT BOARD

David P. Stoklosa, Webster, N.Y.; Christopher S. Pedicini, and Imre A. Pattantyus, both of North Olmsted, Ohio, assignors to Eveready Battery Company, Inc., St. Louis, Mich.

Filed Mar. 24, 1989, Ser. No. 328,550
Int. Cl.[5] H01M *2/22*
U.S. Cl. 429—122 **8 Claims**



1. A battery pack assembly comprising:

at least one galvanic cell having a pair of terminals;

a circuit board over said terminals, said circuit board including at least one insulator sheet adjacent said cell, having an opening at said terminals, and including a thin metal layer preperforated to form a pattern, said pattern including an opening at said terminals and a pair of integral metal tabs generally coplanar with the remainder of said metal sheet and extending into said openings to lie adjacent said terminals;

said insulator sheet and metal layer being laminated together; and

said tabs being secured to said terminals for electrical conductance.

4,920,020

ZINC POWDER FOR ALKALINE BATTERIES

Ivan A. Strauven, Neerpelt, and Marcel L. Meeus, Lommel, both of Belgium, assignors to Metallurgie Hoboken-Overpelt, Hoboken, Belgium

Filed Jan. 4, 1989, Ser. No. 293,445
Int. Cl.[5] H01M *4/42*; C22C *18/00*
U.S. Cl. 429—230 **24 Claims**

1. A zinc base powder for alkaline batteries consisting of 0.05 to 3% of mercury, 0.003 to 0.045% of bismuth, 0.01 to 0.08% of lead, the rest being zinc.

4,920,021

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER

Tomohiro Kimura, Kawasaki, and Yoichi Kawamorita, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 18, 1988, Ser. No. 220,165
Claims priority, application Japan, Jul. 20, 1987, 62-178946
Int. Cl.[5] G03G 5/05
U.S. Cl. 430—56 12 Claims

1. An electrophotographic photosensitive member comprising a photosensitive layer on an electroconductive substrate, the surface layer of said photosensitive layer containing lubricating resin powder and a silicone type graft polymer containing silicone in the side chain.

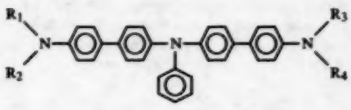
4,920,022

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER COMPRISING ARYL AMINE CHARGE TRANSPORT MATERIAL

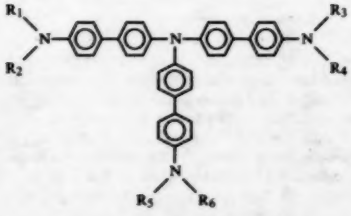
Teigo Sakakibara, Tokyo; Kiyoshi Sakai, Chofu; Harumi Sakoh, Tokyo, and Shoji Amamiya, Sagamihara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 1, 1989, Ser. No. 345,236
Claims priority, application Japan, May 7, 1988, 63-111250; May 7, 1988, 63-111255
Int. Cl.[5] G03G 5/14
U.S. Cl. 430—59 6 Claims

1. An electrophotographic photosensitive member comprising a conductive support and provided thereon a photosensitive layer, wherein said photosensitive layer contains an amine compound represented by the following Formula (I) or Formula (II)



Formula (I)



Formula (II)

wherein R_1, R_2, R_3, R_4, R_5 and R_6 each represent an alkyl group, an aralkyl group, or an aryl group.

4,920,023

STABLE COLOR DEVELOPER COMPOSITIONS AND PROCESS FOR THE PREPARATION THEREOF

Ronald J. Koch, Webster; John F. Knapp, Fairport, and Robert J. Gruber, Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 2, 1988, Ser. No. 201,657
Int. Cl.[5] G03G 13/22, 9/10
U.S. Cl. 430—126 22 Claims

1. A process for the preparation of stable developer compositions, which comprises treating coated carrier particles with metal salts, or metal salts of fatty acids, and thereafter admixing these particles with a colored toner composition containing metal salts or metal salts of fatty acids, and comprised of resin particles and colored pigment particles; and wherein the salts are present on the carrier particles in an amount of from about 0.01 to about 1 percent by weight.

4,920,024

PHOTORECEPTOR EDGE ERASE SYSTEM FOR TRI-LEVEL XEROGRAPHY

James E. Williams, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 30, 1988, Ser. No. 252,097
Int. Cl.[5] G03G 13/01
U.S. Cl. 430—45 4 Claims

1. The method of forming discharged area images on a charge retentive surface without developing the edges of the charge retentive surface outside the image areas, said method including the steps of:

uniformly charging a charge retentive surface substantially across its entire width including the edges thereof beyond the image areas thereof:

forming a discharged image area on said charge retentive surface intermediate said edges; and

presenting developer material to said charge retentive surface that is attracted to said discharged image area and repelled by said charged edges.

4,920,025

CONTROL OF SELENIUM ALLOY FRACTIONATION

Gerald H. Sweatman, Harpenden; Roy Hodgson, Huntingdon, and Robert H. Haste, Stevenage, all of England, assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 179,193, Apr. 8, 1988, Pat. No. 4,859,411.
This application Mar. 23, 1989, Ser. No. 328,829
Int. Cl.[5] G03G 5/08
U.S. Cl. 430—128 15 Claims

1. A process for preparing an electrophotographic imaging member comprising providing pellets of an alloy comprising amorphous selenium and an alloying component selected from the group consisting of tellurium, arsenic, and mixtures thereof, said pellets having an average weight between about 50 mg and about 1000 mg, exposing said pellets to an ambient temperature of between about 114° C. and about 190° C. until an exotherm occurs in said pellets at between about 104° C. and about 180° C., carrying said exotherm through to substantial completion, grinding said pellets into fresh powder having an average particle size of less than about 200 micrometers, and compressing said fresh powder into fresh pellets having an average weight between about 50 mg and about 1000 mg, and heating said fresh pellets to a temperature between about 300° C. and about 350° C. in a vacuum coater to vacuum deposit said alloy onto an adjacent substrate.

4,920,026

IMAGE FORMATION METHOD AND APPARATUS USING LIGHT AND PRESSURE SENSITIVE SHEETS

Hideaki Hagihara, and Iwakazu Honda, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

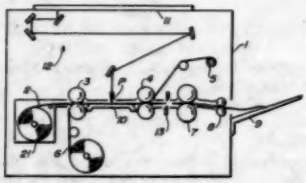
Filed Jul. 12, 1988, Ser. No. 218,577
Claims priority, application Japan, Jul. 17, 1987, 62-179805; Jul. 23, 1987, 62-184348
Int. Cl.[5] G03C 1/72
U.S. Cl. 430—138 4 Claims

1. An image formation method comprising the steps of

superposing a light-accepting sheet formed by coating a transparent colorless base sheet with microcapsules encapsulating a colorless dye and a photopolymerizing agent on top of an image transfer sheet coated with a developing agent having a chromagenic effect on said colorless dye, coated surfaces of said sheets contacting each other,

forming an image on said transparent colorless base sheet by selective hardening of said microcapsules by an image forming beam of light made incident on and through said transparent colorless base sheet of said light-accepting

sheet while said light-accepting sheet and said image transfer sheet remain in contact with each other, and



forming a visible image on said image transfer sheet by applying a pressure on said superposed light-accepting and image transfer sheets together.

4,920,027

LIGHT-SENSITIVE MATERIAL CONTAINING SILVER HALIDE, REDUCING AGENT AND POLYMERIZABLE COMPOUND

Fujio Kakimi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 66,273, Jul. 8, 1987, abandoned, and a continuation-in-part of Ser. No. 101,459, Sep. 28, 1987, abandoned. This application Jul. 5, 1988, Ser. No. 214,961

Claims priority, application Japan, Jun. 25, 1986, 61-150080; Sep. 26, 1986, 61-227767

Int. Cl.[5] G03C *5/54, 1/68, 1/06*

U.S. Cl. 430—138 **12 Claims**

1. A light-sensitive material comprising a light-sensitive layer containing silver halide grains, a reducing agent and a polymerizable compound provided on a support, said silver halide grains and polymerizable compound being contained in microcapsules which are dispersed in the light-sensitive layer, wherein the microcapsules have an average particle size of 8.5 to 20 μm in terms of volume-average particle diameter and such a particle size distribution that the amount of the microcapsules having a particle size of not larger than one sixth part of the average particle size is not more than 1 volume % of the total amount of the microcapsules and the amount of the microcapsules having a particle size of not smaller than twice as large as the average particle size is not more than 1 volume % of the total amount of the microcapsules.

4,920,028

HIGH CONTRAST HIGH THERMAL STABILITY POSITIVE PHOTORESISTS WITH MIXED CRESOL AND HYDROXYBENZALDEHYDE PREPARED NOVOLAK AND PHOTOSENSITIVE DIAZOQUINONE

Richard M. Lazarus, Mission Viejo; Randall Kautz, Irvine, and Sunit S. Dixit, Mission Viejo, all of Calif., assignors to Morton Thiokol, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 175,473, Mar. 31, 1988, abandoned. This application Aug. 2, 1988, Ser. No. 227,404

Int. Cl.[5] G03C *1/60, 1/54*

U.S. Cl. 430—192 **6 Claims**

1. In a positive photoresist comprising an admixture of a bindingly effective amount of a novolak resin and a photoimaging amount of diazoquinone photosensitizer the improvement comprising employing as the novolak resin the condensation product of (a) a mixture of m- and p-cresol and (b) a mixture of aldehydes comprising formaldehyde or a formaldehyde precursor and a monohydroxy aromatic aldehyde selected from the group consisting of 2-hydroxybenzaldehyde, 3-hydroxybenzaldehyde and 4-hydroxybenzaldehyde, wherein the cresol and aldehyde components of the novolak resin are present in the following amounts:

$$\frac{\text{moles total aldehyde}}{\text{moles total cresol}} \times 100 = \text{about 60\% to about 95\%},$$

$$\frac{\text{moles monohydroxy aromatic aldehyde}}{\text{moles total aldehyde}} \times 100 = \text{about 15\% to about 95\%},$$

and wherein the m- and p-cresol are present in the following amounts:

$$\frac{\text{moles m-cresol}}{\text{moles total cresol}} \times 100 = \text{about 30\% to about 75\%}.$$

4,920,029

SILVER HALIDE PHOTOGRAPHIC MATERIAL AND METHOD FOR FORMING SUPER HIGH CONTRAST NEGATIVE IMAGES THEREWITH

Nobuaki Inoue; Senzo Sasaoka; Yoshio Inagaki; Tetsuro Kojima, and Morio Yagihara, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

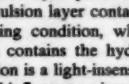
Continuation of Ser. No. 906,465, Sep. 12, 1986, abandoned. This application Aug. 23, 1988, Ser. No. 235,805

Claims priority, application Japan, Sep. 18, 1985, 60-206093

Int. Cl.[5] G03C *1/06*

U.S. Cl. 430—264 **18 Claims**

1. A negative type silver halide photographic material comprising a support having provided thereon at least one silver halide emulsion layer which has a substantial influence upon image density and at least one light-insensitive hydrophilic colloid layer, wherein a hydrophilic colloid layer other than said silver halide emulsion layer contains a hydrazine derivative in a non-diffusing condition, wherein the hydrophilic colloid layer which contains the hydrazine derivative in a non-diffusing condition is a light-insensitive layer which does not have a substantial influence on image density, and wherein said hydrazine derivative is represented by formula (I):



(I)

wherein A_1 and A_2 both represent hydrogen atoms, or one of A_1 and A_2 represents a hydrogen atom and the other represents a sulfinic acid residue; R_1 represents an aliphatic group, an aromatic group, or a heterocyclic group; R_2 represents a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted alkoxy group, or a substituted or unsubstituted aryloxy group; and G represents a carbonyl group, a sulfonyl group, a sulfoxy group, a phosphoryl group, or an N-substituted or unsubstituted iminomethylene group, provided that at least one of R_1 and R_2 contains at least one group having a pKa of from 8 to 13 which is capable of dissociating into an anionic ion.

4,920,030

PHOTOSENSITIVE COATING EMULSION FOR PLASTIC FILMS

Kunihiro Ichimura, Yatabemachi, and Keiji Kubo, Hyogo, both of Japan, assignors to General Director of the Agency of Industrial Science and Technology, Tokyo and Dulcel Chemical Industries, Ltd., Osaka, both of, Japan

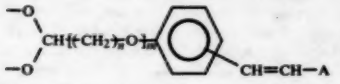
Continuation of Ser. No. 30,835, Feb. 4, 1987, abandoned. This application Jan. 19, 1989, Ser. No. 298,855

Int. Cl.[5] G03C *1/76*

U.S. Cl. 430—270 **8 Claims**

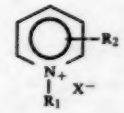
1. A photosensitive coating emulsion consisting essentially of a film-forming polymer and a photocrosslinkable polyvinyl alcohol having a degree of saponification of 75 molar % or

above and an average degree of polymerization of 300 to 3000 and containing at least one photocrosslinkable constituent unit present in an amount of 0.5 to 10 molar % based on said photocrosslinkable polyvinyl alcohol, and selected from the group consisting of units represented by the general formula (I):



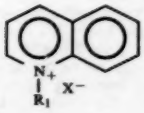
(I)

wherein A is a group represented by the general formula (II) or (III):



(II)

or

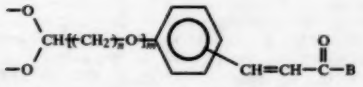


(III)

wherein:

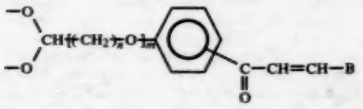
R^1 represents a hydrogen atom, an alkyl group or an aralkyl group which may contain a hydroxyl, a carbamoyl group, an ether or an unsaturated bond,

R^2 represents a hydrogen atom or a lower alkyl group, X^- represents an anion, m represents 0 or 1, and n represents a positive number of 1 or 6, and units represented by the general formula (IV):



(IV)

or the general formula (V):



(V)

wherein B represents an aromatic or a heterocyclic group having at least one polar group and m and n are as defined above,

dispersed in a dispersion medium

which comprises 95 to 50% by weight of water and 5 to 50% by weight of at least one lower aliphatic alcohol as an anti-foaming agent where672 in said lower aliphatic alcohol is present in an amount of 0.001 to 0.01% by weight based on the amount of said photosensitive emulsion and is selected from the group consisting of methyl, ethyl, n-propyl and i-propyl alcohols, said photocrosslinkable constituent unit is present in an amount of from 0.5 to 10 molar % based on said constituent urit of said polyvinyl alcohol, and wherein the weight ratio of said emulsion containing said film forming polymer to said photocrosslinkable polyvinyl alcohol is between 100:10 and 100:200.

4,920,031

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE ELEMENTS CONTAINING WATER SOLUBLE DYESTUFFS

Shigeru Ohno; Yoshio Inagaki; Keiichi Adachi, and Yasuhito Momoki, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

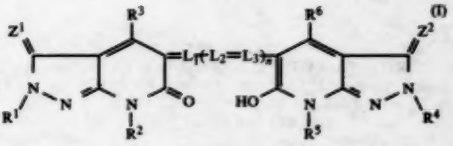
Filed Jun. 20, 1988, Ser. No. 208,608

Claims priority, application Japan, Jun. 19, 1987, 62-153132

Int. Cl.[5] G03C 1/84

U.S. Cl. 430—522 **13 Claims**

1. A silver halide photographic light-sensitive element comprising a support, at least one silver halide emulsion layer and at least one dyestuff represented by the general formula (I), wherein the content of the dyestuff is from 0.05 to 3.0 in terms of optical density:



(I)

wherein R^1 and R^4 each represent a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group or a substituted or unsubstituted heterocyclic group; R^2 and R^5 each represent a substituted or unsubstituted aryl group, a substituted or unsubstituted heterocyclic group, $—COR^7$ or $—SO_2R^7$; R^3 and R^6 each represent a hydrogen atom, a cyano group, a hydroxyl group, a carboxylic acid group, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, $—COOR^7$, $—OR^7$, $—NR^8R^9$, $—N(R^8)COR^9$, $—N(R^8)SO_2R^9$, $—CONR^8R^9$ or $—N(R^8)CONR^8R^9$ (wherein R^7 represents a substituted or unsubstituted alkyl group or a substituted or unsubstituted aryl group, and R^8 and R^9 each represent a hydrogen atom, a substituted or unsubstituted alkyl group or a substituted or unsubstituted aryl group); Z^1 represents an oxygen atom or $=NR^{10}$; Z^2 represents an oxygen atom or $=NR^{11}$ (wherein R^{10} and R^{11} represent nonmetal atomic groups necessary for forming a five-membered ring, which may have substituent(s) with linkage to R^1 and R^4 respectively); L_1, L_2 and L_3 each represent a substituted or unsubstituted methine group, or L_1, L_2 and L_3 as a whole represent a substituted or unsubstituted cyclic group where methine groups are linked together; and n represents 0, 1 or 2; provided that at least one of R^1, R^2, R^3, R^4, R^5, R^6, L_1, L_2 and L_3 represents a group having at least one carboxylic acid group or at least one sulfonic acid group.

4,920,032

SILVER HALIDE PHOTOSENSITIVE MATERIAL

Ichizo Toya, and Masakazu Yoneyama, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

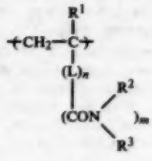
Filed Dec. 7, 1988, Ser. No. 280,841

Claims priority, application Japan, Dec. 7, 1987, 62-309345

Int. Cl.[5] G03C 1/06

U.S. Cl. 430—536 **11 Claims**

1. A silver halide photosensitive material comprising at least one silver halide photographic emulsion layer provided on at least one side of a support, said photosensitive material containing in the photographic emulsion layer and/or another component layer (i) a polymer having repetitive units represented by formula (II), dextran or mixtures thereof, and (ii) at least one cationic compound containing quaternary nitrogen:



(II)

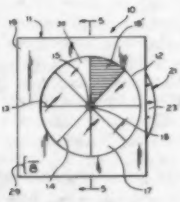
wherein R_1 represents hydrogen or an alkyl group with 1 to 6 carbon atoms; R^2, and R^3 each represents hydrogen, or an unsubstituted or substituted alkyl, aryl or aralkyl group having up to 10 carbon atoms, or R^2 and R^3 are bonded to each other to form a nitrogen-containing heterocyclic ring; m represents 1 or 2; n represents 0 or 1; and L represents a linking group of the valence m+1.

4,920,033

ROTATABLE DISK TEACHING APPARATUS

John E. Cress, 2833 Cambridge, Chicago, Ill. 60657

Filed Jan. 29, 1988, Ser. No. 150,208
Int. Cl.[5] G09B 1/22, 23/02
U.S. Cl. 434—198 **26 Claims**



1. A demonstrative teaching apparatus for disclosing relationships between variable pie-shaped segments on a first surface and indicia corresponding to same on a second surface opposite to said first surface, said apparatus comprising:

apparatus housing means having a front side with front side viewing means through which said variable pie-shaped segments on said first surface may be viewed, together with a rear side with rear side viewing means through which said corresponding indicia on said second surface opposite to said first surface may be viewed;

circular disk means operably positioned for rotation within said apparatus housing means and on which first and second surfaces are respectively positioned,

said circular disk means including, on said first surface aligned with said front side viewing means, proximate to the front side of said apparatus housing means, helical disk means substantially concentric with said circular disk means and operably attached thereto, for portraying said variable pie-shaped segments,

said circular disk means further including, on said second surface aligned with said rear side viewing means, proximate to the rear side of said apparatus housing means, a plurality of said indicia correspondingly displaying, through said rear viewing means, values associated with the amount and position of said variable pie-shaped segments disclosed through said front viewing means;

slotted plate means operably positioned between said helical disk means on said first surface of said circular disk means and, said front side viewing means in said front side of said apparatus housing means, for operable disclosure of said variable pie-shaped segments,

said slotted plate means including helical disk slot means through which the outermost free end of said helical disk means protrudes in juxtaposed fashion to disclose, as desired, said variable pie-shaped segments advanced by said helical disk means, while said slotted plate means masks the remainder of said juxtaposed helical disk means and said circular disk means from view through said front side viewing means,

said disclosed variable pie-shaped segments of said helical disk means being extendably and retractably propelled through said helical disk slot means in said slotted plate means, through the forward and rearward rotation, respectively, of said circular disk means, and in turn, said helical disk means which are operably attached to said circular disk means within said apparatus housing means;

circular disk rotation means for enabling said forward and rearward rotation of said circular disk means, as desired, by a user to, in turn, enable variations in the amount and position of said disclosed variable pie-shaped segments displayed through said front side viewing means of said apparatus housing means, simultaneous with the disclosure of said indicia corresponding thereto, as displayed through said rear side viewing means of said apparatus housing means;

said invention further comprising reverse rotation stopping means for limiting the extent to which said circular disk means and, in turn, said helical disk means may be reversably rotated;

said reverse rotation stopping means comprising stop tab means having a first end operably secured to said second side of said circular disk means and a second end emanating angularly outwardly therefrom, and

radially positioned stop arm means having a first end operably juxtaposed to and emanating from the center of the second side of said circular disk means and a second end operably affixed to said slotted plate means,

said stop arm means engaging said stop tab means to limit the reverse rotation of said circular disk means to preclude against the inadvertent unthreading of said helical disk means from within said helical disk slot means in said slotted disk means.

4,920,034

SILVER HALIDE PHOTOGRAPHIC MATERIAL AND IMAGE FORMING METHOD USING THE SAME

Senzo Sasaoka, and Nobuaki Inoue, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 918,443, Oct. 14, 1986, abandoned.
This application May 15, 1989, Ser. No. 352,613
Claims priority, application Japan, Oct. 17, 1985, 60-232086
Int. Cl.[5] G03C 1/06
U.S. Cl. 430—264 **18 Claims**

1. A silver halide photographic material comprising a surface latent image type silver halide emulsion layer unit on a support, and containing a hydrazine compound in at least one of said emulsion layer unit and other constituent layers, said emulsion layer unit being composed of at least two layers, one of which is a fine-grained low sensitivity emulsion layer and one of which is a coarse-grained high-sensitivity emulsion layer, with the silver halide emulsion present in the fine-grained low sensitivity emulsion layer having an average grain size of not more than 80% of the average grain size of the coarse-grained high-sensitivity silver halide emulsion in the coarse-grained high-sensitivity emulsion layer, and said silver halide photographic material attains a contrast of 10 or more in terms of gamma value when a developer containing at least 0.15 mole/liter of sulfite ions and having a pH of from 9.5 to 12.3 is used, wherein the hydrazine compound is represented by formula (I):

$$R_1—NHNH—G—R_2$$

wherein R_1 is an aliphatic group or an aromatic group; R_2 is a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted alkoxy group; or a substituted or unsubstituted aryloxy group; and G represents a carbonyl group, a sulfonyl group, a

sulfoxy group, a phosphoryl group, or an N-substituted or unsubstituted iminomethylene group, said silver halide photographic material consisting essentially of said surface latent image type silver halide emulsion layer unit.

4,920,035

IMAGE FORMING METHOD

Katsumi Hayashi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 19, 1987, Ser. No. 109,379

Claims priority, application Japan, Oct. 17, 1986, 61-247242; Oct. 20, 1986, 61-249305

Int. Cl.[5] G03C 1/06

U.S. Cl. 430—267 **21 Claims**

1. A method for forming an image, comprising the steps of:

(a) imagewise exposing a photographic silver halide light-sensitive material comprising at least a silver halide, a hydrazine derivative as a contrast enhancing agent, and a substantially water-insoluble metal compound,

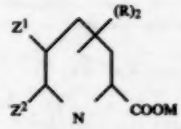
(b) developing the exposed material with a treating solution

(i) containing a complexing compound capable of water-mediated complexing reaction with the metal ion of said substantially waterinsoluble metal compound, and

(ii) being free of a phosphate buffer, and

(c) treating the developed material with a fixer solution containing a water soluble aluminum salt as a hardening agent.

8. The image forming method of claim 1 wherein said complexing compound is selected from compounds having the general formula:



wherein R represents an electron donative substituent selected from the group consisting of hydrogen, an aryl group, a halogen atom, an alkoxy group, a —COOM group, a hydroxycarbonyl group, an amino or substituted amino group, and an alkyl group, the two R's may be the same or different,

Z^1 and Z^2 are as defined for R and may be combined together to form a ring fused to the pyridine ring, and

M is an alkali metal ion, substituted or unsubstituted guanidinium ion, amidinium ion, or quaternary ammonium ion.

4,920,036

PHOTOSENSITIVE RECORDING ELEMENT HAVING PIGMENTED PHOTOPOLYMER LAYER

Mikio Tetsuka; Fumiaki Shinozaki; Yuichi Wakata, and Tomizo Namiki, all of Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 211,147, Jun. 22, 1988, abandoned, which is a continuation of Ser. No. 908,732, Sep. 18, 1986, abandoned. This application Sep. 7, 1989, Ser. No. 404,068

Claims priority, application Japan, Sep. 20, 1985, 60-207979

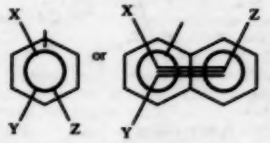
Int. Cl.[5] G03C 1/76

U.S. Cl. 430—270 **3 Claims**

1. In a photosensitive recording material comprising a support, an intermediate layer and a coated photopolymer-containing layer which comprises a photopolymer developable with an alkaline solution, a photosensitive agent selected from the group consisting of an azide-type photosensitive agent, Michler's Ketone and a quinonediazide-type photosensitive agent, and a pigment, wherein said pigment is a compound having the formula (I):

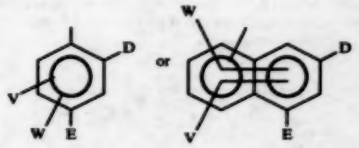
$$[A-N=N-B]^{n-}\ M^{n+} \qquad (I)$$

wherein A is



wherein each of X, Y and Z is any one of a carboxylic acid group, sulfonic acid group, an alkyl group having 1–12 carbon atoms, an alkoxyl group having 1–12 carbon atoms, a nitro group, a halogen atom and a hydrogen atom;

B is



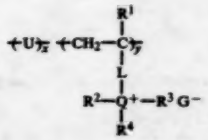
wherein each of V and W is any one of a caboxylic acid group, a sulfonic acid group, and a hydrogen atom; and each of D and E is a hydrogen atom or a hydroxyl group, and at least one of D and E is a hydroxyl group; and

at least one of X, Y, Z, V and W is a carboxylic acid group or a sulfonic acid group;

M is a metal atom; and

n is an integer of from 1–5; and

said photopolymer containing layer contains a compound having the formula (II):



(II)

wherein U is an ethylenic unsaturated monomer; L is a divalent group having 1–12 carbon atoms; Q is a nitrogen atom or a phosphorous atom; R^1 is a hydrogen atom or an alkyl group having 1–6 carbon atoms; each of R^2, R^3 and R^4 independently is an alkyl group having 1–12 carbon atoms or an already group having 7–20 carbon atoms; G^- is a monovalent anion; x is number in the range of 0–90 molar %; and Y is a number in the range of 10–100 molar %;

said pigment of the formula (I) being contained in the photopolymer containing layer in an amount within the range of 1–30% by weigh based on the solid component of the photopolymer containing layer and said compound of the formula (II) and said pigment of the formula (I) being contained in the photopolymer containing layer in a weight ratio of from 1:99 to 70:30.

4,920,037

PHOTOPOLYMERIZABLE COMPOSITION

Noriaki Takahashi, Yokohama, and Noriko Watanabe, Machida, both of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Continuation of Ser. No. 62,077, Jun. 10, 1987, abandoned. This application Sep. 13, 1989, Ser. No. 406,180

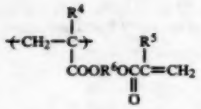
Claims priority, application Japan, Jun. 10, 1986, 61-134532

Int. Cl.[5] G03C 1/76

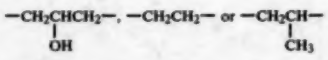
U.S. Cl. 430—287 7 Claims

1. A photopolymerizable composition, comprising:

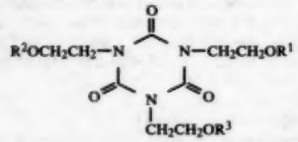
(a) about 10–80% by weight of a diallyl phthalate polymer having a weight-average molecular weight not less than 10,000 or a (meth)acrylic polymer having a weight-average molecular weight of not less than 10,000 and having repeating units therein of the formula:



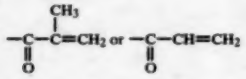
wherein R^4 and R^5 are the same or different and represent a hydrogen atom or a methyl group, and R^6 represents a group of the formula:



(b) a compound having the formula:



wherein R^1, R^2 and R^3 represent a hydrogen atom, or a group of the formula:



with the proviso that not more than one of R^1, R^2 or R^3 is a hydrogen atom at the same time; and

(c) an effective amount of a photoinitiator.

4,920,038

PRINTED CIRCUIT MANUFACTURE EMPLOYING A RADIATION CROSS-LINKABLE PHOTO-POLYMER SYSTEM

Klaus Budde, Unterhaching; Oskar Nuyken, and Walter Melchior, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich

Continuation of Ser. No. 858,920, May 2, 1986, abandoned. This application Nov. 3, 1988, Ser. No. 267,677

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1985, 3520277

Int. Cl.[5] G03C 5/16, 1/94, 5/00

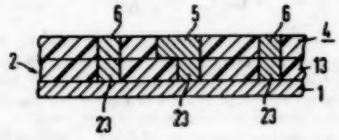
U.S. Cl. 430—315 8 Claims

1. A method for the manufacture of a printed circuit comprising the steps of successively

(a) coating a metal foil with a layer comprised of a photosensitive furyl acrylic acid esterified epoxy resin having a molecular weight below approximately 15,000, the resin being produced by reacting a bisphenol A-epichlorohydrin-phenoxy resin with 3-(2-furyl)-acrylic acid chloride the layer including a photo-initiator;

(b) exposing said layer to imaging irradiation, thereby to produce a latent image of a desired wiring structure, the exposing being accomplished by light radiation having a wavelength of approximately 150 to about 400 nm without subsequent hot-hardening;

(c) washing the resulting so irradiated layer with a solvent to dissolve away unexposed portions thereof, thereby to



produce a developed image of such desired wiring structure in the resulting so washed layer through which areas of said metal foil are exposed;

(d) metallizing the resulting so washed, irradiated layer to deposit metal in said layer portions wherein said metal foil areas were so exposed; and

(e) producing further successive layers upon said resulting so exposed and so washed layer of said furyl acrylic acid esterified epoxy resin, each such successive layer being produced by the successive repetition of said steps (a), (b), (c), and (d) without the need for grinding the further successive layers.

4,920,039

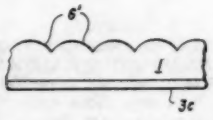
MULTIPLE IMAGING

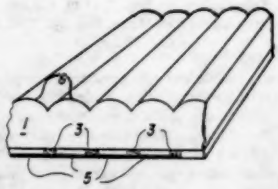
Richard A. Fotland, Holliston; Gary V. Grosclaude, Wayland, both of Mass., and Richard L. Briere, decessased, late of Hopkinton, Mass. (by Eleanor L. Briere, Administrator), assignors to Dennison Manufacturing Company, Framingham, Mass.

Continuation-in-part of Ser. No. 225,505, Jul. 28, 1988, which is a continuation of Ser. No. 816,497, Jan. 6, 1986, abandoned. This application Dec. 6, 1988, Ser. No. 280,373

Int. Cl.[5] G03C 5/16

U.S. Cl. 430—324 10 Claims





1. An imaging method which comprises the steps of:

(a) embossing a plastic film to produce an array of lenticles on said film,
(b) printing an image with a visible light absorbing UV sensitive imaging layer on the side of the film opposite the array of lenticles;
(c) exposing portions of the printed image to collimated ultraviolet radiation by passing said ultraviolet radiation through said lenticles,
(d) rinsing the imaging layer with an aqueous media thereby rinsing away said unexposed portions of the image, resulting in a film product whereby an image can be made to appear and disappear by viewing the lenticular side of the film and changing the viewing angle in relation to the plane of the film.

4,920,040

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL FOR A LASER LIGHT EXPOSURE

Kouzi Ono, Tokyo, Japan, assignor to Konica Corporation, Tokyo, Japan

Filed Dec. 1, 1988, Ser. No. 278,318
Claims priority, application Japan, Dec. 3, 1987, 62-307208
Int. Cl.[5] G03C *7/00, 5/24, 1/02*
U.S. Cl. 430—363 **10 Claims**

1. A silver halide light-sensitive photographic material for a laser light exposure, comprising:

a support having thereon at least one light-sensitive silver halide emulsion layer containing silver halide grains; and

a layer adjacent to said at least one light-sensitive silver halide emulsion layer, wherein said silver halide grains are spectrally sensitized with a dye represented by formula I and at least one layer of said at least one silver halide emulsion layer and said adjacent layer contains a fluorine-containing ionic surfactant, a non-ionic surfactant and an inorganic salt, wherein said inorganic salt is a halide, a phosphate or a thyocyanate of alkali metal, alkali earth metal or ammonium;

wherein

Z_1 and Z_2 independently represent an atomic group needed for completing a five- or six-membered nitrogen-containing heterocycle;

R_1 and R_2 independently represent a saturated or unsaturated aliphatic group;

Q_1 and Q_2 independently represent an atomic group needed for completing a 4-thiazolidinone, a 4-oxazolidinone, a 4-imidazolidinone, a 5-thiazolidinone, a 5-oxazolidinone or a 5-imidazolidinone ring;

L_1, L_2 and L_3 independently represent a methin group or a substituted methin group

wherein R_3 represents a methyl group, an ethyl group, an ethoxy group or an aryl group;

X represents an inorganic or organic acid anion; and

m and n independently represent an integer of 0 to 3.

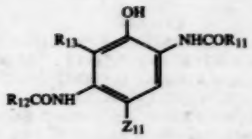
4,920,041

METHOD FOR PROCESSING A SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL USING A DEVELOPER SUBSTANTIALLY FREE OF BENZYL ALCOHOL AND SULFITE

Nobutaka Ohki; Kazuto Andoh, and Takatoshi Ishikawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

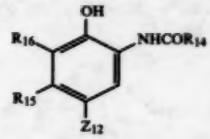
Continuation of Ser. No. 82,455, Aug. 7, 1987, abandoned. This application Jan. 12, 1989, Ser. No. 296,238
Claims priority, application Japan, Aug. 7, 1986, 61-184328
Int. Cl.[5] G03C *7/30, 7/00*
U.S. Cl. 430—380 **26 Claims**

1. A method for processing a silver halide color photographic material containing a reflective support having thereon at least one light-sensitive silver halide emulsion layer, comprising: providing at least one light-sensitive silver halide emulsion layer which contains at least one cyan coupler represented by formula (C-I) or (C-II):



(C-I)

wherein R_{11} is selected from the group consisting of an alkyl group, a cycloalkyl group, an aryl group, an amino group and a heterocyclic group; R_{12} is selected from the group consisting of an alkyl group and an aryl group; R_{13} is selected from the group consisting of a hydrogen atom, a halogen atom, an alkyl group and an alkoxy group; or R_{13} may be bonded to R_{12} to form a ring; and Z_{11} is selected from the group consisting of a hydrogen atom, a halogen atom and a group capable of being released by the reaction with the oxidation product of an aromatic primary amine color developing agent;

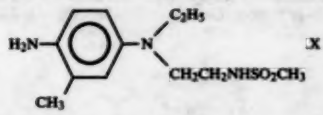


(C-II)

wherein R_{14} is selected from the group consisting of an alkyl group, a cycloalkyl group, an aryl group and a heterocyclic group; R_{15} represents an alkyl group having two or more carbon atoms; R_{16} is selected from the group consisting of hydrogen atom, a halogen atom and an alkyl group; and Z_{12} is selected from the group consisting of a hydrogen atom, a halogen atom and a group capable of being released by the reaction with the oxidation product of an aromatic primary amine color developing agent;

and, after image-wise exposing, developing said silver halide color photographic material with a color developing solution which

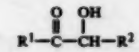
(a) does not substantially contain benzyl alcohol,
(b) contains sulfite in an amount of from about 0 g/l to about 1 g/l,
(c) contains an aromatic primary amine color developing agent represented by formula (A):



(A)

wherein X represents a compound capable of forming a salt with a primary amine, and

(d) contains a compound represented by formula (I):



(I)

wherein R^1 is selected from the group consisting of a hydrogen atom, an alkyl group which may be substituted, an aryl group which may be substituted, an alkoxy group which may be substituted, an aryloxy group which may be substituted, and an amino group which

may be substituted; and R^2 is selected from the group consisting of a hydrogen atom, an alkyl group which may be substituted and an aryl group which may be substituted; or R^1 and R^2 may be bonded to each other to form a carbon ring or a hetero-ring.

4,920,042

COLOR IMAGE FORMING PROCESS COMPRISING DEVELOPING WITH SUBSTANTIALLY NO BENZYL ALCOHOL A MATERIAL HAVING SPECIFIC SENSITIZING DYES

Kokichi Waki; Masahiro Asami, and Yoshinori Shibata, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 124,799, Oct. 20, 1987, abandoned. This application Aug. 10, 1989, Ser. No. 394,301

Claims priority, application Japan, Feb. 20, 1986, 61-35748

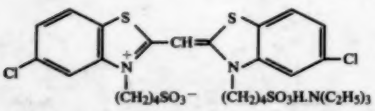
Int. Cl.[5] G03C *7/30, 7/32, 1/12, 1/14*

U.S. Cl. 430—380 **20 Claims**

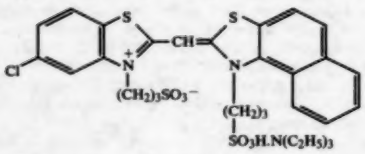
1. A color image-forming process, which comprises, after imagewise exposing a silver halide color photographic material having on a reflective support at least one each of a blue-sensitive emulsion layer, a green-sensitive emulsion layer and a red-sensitive emulsion layer.

said blue-sensitive emulsion layer containing a monodisperse silver chlorobromide emulsion spectrally sensitized by Compound I-1, I-2 or I-10,

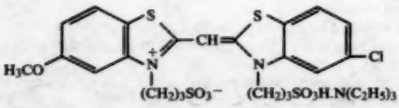
(I-1)



(I-2)

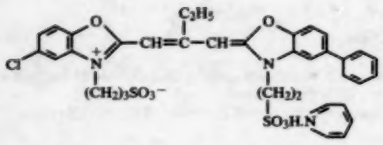


(I-10)

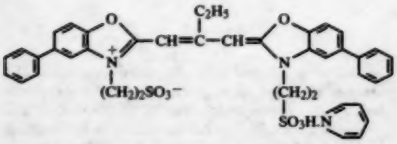


said green sensitive emulsion layer containing a monodispersed silver chlorobromide emulsion spectrally sensitized by Compound II-2, II-3 or II-8, and

(II-2)



(II-3)



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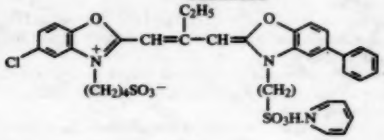
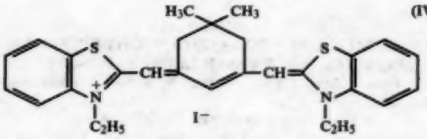
(II-8)

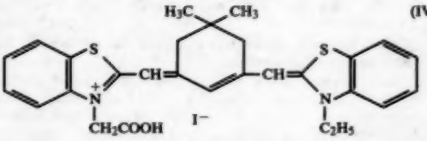


said red-sensitive emulsion layer containing a monodispersed silver chlorobromide emulsion spectrally sensitized by Compound IV-1 or IV-2

(IV-1)



(IV-2)



and

these layers each containing substantially no silver iodide, containing silver chloride in an amount of from 60 mol % to less than 80 mol % of the total silver halide amount and having a coefficient of deviation of not more than 20%, developing the color photographic material using a color developer wherein the concentration of benzlyl alcohol is 1 ml/1 or less within a development time of 2 minutes and 30 seconds.

4,920,043

METHOD FOR PROCESSING SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Minoru Ohashi, and Shoichi Horii, both of Nagaokakyo, Japan, assignors to 501 Mitsubishi Paper Mills Limited, Tokyo, Japan

Filed Mar. 15, 1989, Ser. No. 323,873

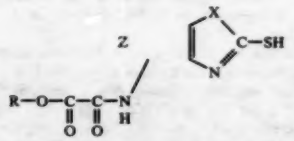
Claims priority, application Japan, Mar. 18, 1988, 63-66186; Mar. 22, 1988, 63-68452; Oct. 12, 1988, 63-257638

Int. Cl.[5] G03C *1/34*

U.S. Cl. 430—611 **9 Claims**

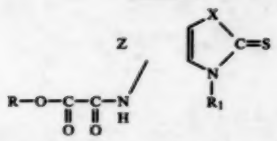
1. A method for photographic processing of a silver halide photographic light-sensitive material which comprises imagewise exposing a silver halide photographic light-sensitive material and then developing the exposed light-sensitive material in the presence of at least one compound selected from the group consisting of the compounds represented by the following formulas (I)–(IV):

(I)

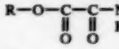


-continued

(II)

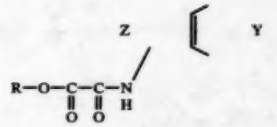


wherein Z represents a group of atoms necessary to form a condensed aromatic ring which may have a substituent in addition to

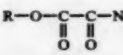


R represents a hydrogen atom or a monovalent organic group, R_1 represents a hydrogen atom or a substituted or unsubstituted alkyl group and X represents an oxygen atom, a sulfur atom, selenium atom or $>N-R_2$ wherein R_2 represents a hydrogen atom or a substituted or unsubstituted alkyl group;

(III)

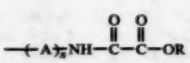


wherein Y represents a group of atoms necessary to form a heterocyclic ring having two or more nitrogen atoms, Z represents a group of atoms necessary to form a condensed aromatic ring which may have a substituent in addition to



and R represents a hydrogen atom or a monovalent organic group; and

(IV)



wherein Y represents a group of atoms necessary to form a nitrogen-containing heterocyclic ring containing no condensed aromatic ring, R represents a hydrogen atom or a monovalent organic group, A represents an arylene group and n is 0 or 1.

4,920,044

INTRACELLULAR FLUSH SOLUTION FOR PRESERVING ORGANS

Peter D. Bretan, Jr., Novato, Calif., assignor to The Cleveland Clinic Foundation, Cleveland, Ohio

Filed Nov. 8, 1988, Ser. No. 268,809

Int. Cl.[5] A01N *1/02*

U.S. Cl. 435—1 **17 Claims**

1. An intracellular flush solution for preserving an organ for transplantation, comprising:

(a) between about 1.54 and 2.56 grams per liter of KH_2PO_4;

(b) between about 7.38 and 12.2 grams per liter of K_2HPO_4;

(c) between about 0.84 and 1.40 grams per liter of KCl;

(d) between about 0.63 and 1.05 grams per liter of $NaHCO_3$;

(e) between about 0 and 2.87 grams per liter of $KHCO_3$;

(f) between about 20 and 37 grams per liter of mannitol;

(g) between about 0 and 4.62 grams per liter of $MgSO_4$;

(h) between about 0 and 0.4 meq/ml of $MgCl_2$;

(i) between about 0.75 and 1.25 grams per liter of adenosine;

(j) between about 0 and 0.125 grams per liter of allopurinol; and,

(k) between about 0 and 1.0 grams per liter of verapamil.

4,920,045

DETECTION OF OCCULT BLOOD IN FECES

Shoji Okuda, Nagaokakyo, and Kazuo Uchida, Kobe, both of Japan, assignors to Kyoto Medical Science Laboratory, Kyoto, Japan

Filed Sep. 22, 1988, Ser. No. 247,616

Int. Cl.[5] G07N *53/00*; C07G *15/00*; C07K *3/00*; G01N *33/72*

U.S. Cl. 435—7 **4 Claims**

1. A method for detection of occult blood in a fecal sample comprising simultaneously reacting said fecal sample with antibodies to hemoglobin and antibodies to transferrin and determining the presence of immunologic reaction products of said hemoglobin and transferrin as an indication of the presence of occult blood.

4,920,046

PROCESS, TEST DEVICE, AND TEST KIT FOR A RAPID ASSAY HAVING A VISIBLE READOUT

Edward McFarland, Baltimore; Keith Uithoven, West Friendship, both of Md., and Jeffrey Carlson, Mountain View, Calif., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Continuation-in-part of Ser. No. 16,846, Feb. 20, 1987, abandoned. This application Oct. 8, 1987, Ser. No. 106,757

Int. Cl.[5] G01N *33/53*, *33/543*, *33/544*, *1/48*

U.S. Cl. 435—7 **20 Claims**

1. A device for use in an assay for detecting the presence of an analyte using a tracer having a particulate label comprising:

a porous support having upper and lower surfaces and a test area on its upper surface;

a binder attached to the test area;

an absorptive layer in fluid communication with the porous support; and

a porous flow control layer positioned between the lower surface of the porous support and the absorptive layer;

wherein:

the porous support has pore sizes sufficient to allow passage of liquid and any analyte and tracer not bound to the test area,

the support area does not specifically bind the tracer,

the test area has a surface area sufficiently large to support binder in a concentration whereby tracer specifically bound to the test area under assay conditions is visible,

the porous flow control layer has unidirectional channels with their pore sizes smaller than those of the porous support and large enough to allow passage at controlled rates of liquid and any analyte and tracer not bound at the test area, and

the porous support, the porous flow control layer and the absorptive layer cooperate to control flow of reagents through the porous support and to receive liquids and any analyte and tracer not specifically bound at the test area in absorptive layer.

4,920,047

ELECTRICAL DETECTION OF THE IMMUNE REACTION

Ivar Giaever, Schenectady, and Charles R. Keese, Schoharie, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 20, 1988, Ser. No. 196,718

Int. Cl.[5] G01N *33/53*

U.S. Cl. 435—7 **9 Claims**

1. A method for determining the presence of, the concentra-

tion of, or the absence of, a first immunologically-active substance in a liquid medium, said method comprising the steps of:

(i) providing an electrode comprising a plurality of metal film in a small area, in the range of from about 10^{-10} cm^2 to about 10^{-2} cm^2, on a substrate;

(ii) adsorbing a second immunologically-active substance capable of binding said first immunologically-active substance to said electrode;

(iii) contacting said electrode having said second immunologically-active substance adsorbed thereon with a liquid medium to be analyzed for said first immunologically-active substance;

(iv) contacting said electrode with a liquid medium comprising a third immunologically-active substance linked to an enzyme and capable of binding with said second immunologically-active substance and incapable of binding with said first immunologically-active substance;

(v) contacting said electrode with a liquid medium comprising an enzyme substrate capable of reacting with said enzyme linked to said third immunologically-active substance;

(vi) immersing said electrode into a measuring solution; and

(vii) measuring electrical impedance of said electrode whereby no change or only a slight change in impedance indicates the presence of said first immunologically-active substance and a larger change indicates the absence of said first immunologically-active substance, the degree of change being proportional to the concentration of said first immunologically-active substance in said liquid medium.

4,920,048

METHOD FOR STABILIZING EXTRA-CHROMOSOMAL ELEMENTS IN BACTERIA DURING CULTIVATION

Borge K. Diderichsen, Hellerup, Denmark, assignor to Novo Industri A/S, Denmark

Filed Dec. 10, 1985, Ser. No. 807,483

Claims priority, application Denmark, Dec. 12, 1984, 5940/85

Int. Cl.[5] C12P *21/00;* **C12N** *15/00, 9/90, 1/20*

U.S. Cl. 435—69.1 **10 Claims**

10. A method for the production of a protein or polypeptide in transformed Bacillus or Escherichia bacteria which comprises:

(a) inserting a dal gene capable of expressing active D,L-alanine racemase bacteriophage wherein said palsmid or bacteriophage also contains a gene for a protein or polypeptide to be produced;

(b) transforming a bacterial host cell selected from the group consisting of Bacillus and Escherichia, said bacterial host cell having a defect in the chromosomal dal gene for D,L-alanine racemase, with said plasmid or bacteriophage;

(c) culturing the transformed bacterial host cell of step (b) in a nutrient medium wherein the D-alanine requirement of said transformed bacterial host cell caused by its chromosomal gene defect is complemented by the dal gene contained in said plasmid or bacteriophage, and under conditions wherein said protein or polypeptide is produced; and

(d) recovering said protein or polypeptide produced in step (c).

4,920,049

PROCESS FOR THE CONTINUOUS PRODUCTION OF FRUCTOSE-1,6-DI-PHOSPHATE BY EMPLOY OF IMMOBILIZED YEAST

Guglielmo M. Bisso, Via A.G. Barriti, and Federico Melelli, Via Domodossola 26, both of Rome, Italy

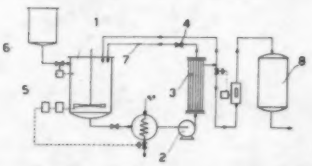
Filed Jul. 15, 1987, Ser. No. 73,451

Claims priority, application Italy, Aug. 6, 1986, 21422 A/86

Int. Cl.[5] C12P *19/02;* **C12N** *11/04*

U.S. Cl. 435—105 **7 Claims**

1. A process for the continuous production of fructose-1,6-diphosphate, which comprises phosphorylating dextrose by means of glutaraldehyde-treated yeast continuously supplied with a nutrient mixture and continuously recovering fructose-



1,6-diphosphate by permeation across a hollow fiber ultrafiltration unit.

4,920,050

ACIDIC POLYCYCLIC ETHER ANTIBIOTIC

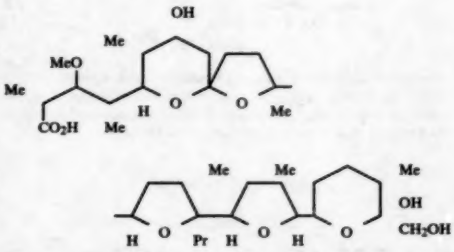
Walter P. Cullen; James R. Hauske, both of East Lyme; Gloria J. Kostek, Preston, all of Conn.; Hiroshi Maeda, Aichi, and Junsuke Tone, Chita, both of Japan, assignors to Pfizer Inc., New York, N.Y.

Filed Feb. 27, 1989, Ser. No. 315,953

Int. Cl.[5] C12P *17/18, 17/06;* **C12N** *1/20;* **C07D** *317/00*

U.S. Cl. 435—119 **6 Claims**

1. A process for the preparation of a compound of the formula



wherein Me is CH_3 and Pr is $CH_3CH_2CH_2$, or a pharmaceutically acceptable salt thereof, which comprises fermentation of Streptomyces sp. ATTC 53862 under submerged aerobic conditions in an aqueous nutrient medium comprising an assimilable source of carbon and nitrogen until a recoverable amount of said compound is formed.

4,920,051

RECOVERY OF UROKINASE COMPOUNDS

Timothy Edmunds, Weymouth, and Susan F. Foley, Brighton, both of Mass., assignors to Damon Biotech, Inc., Needham Heights, Mass.

Continuation-in-part of Ser. No. 151,707, Feb. 3, 1988. This application Jun. 10, 1988, Ser. No. 205,437

Int. Cl.[5] C12N *9/72*

U.S. Cl. 435—215 **14 Claims**

1. A method for extracting a urokinase compound from a solution of urokinase compounds and other proteins, said method comprising the steps of:

(a) contacting a urokinase compound-containing protein solution with a particulate, silicaceous matrix under conditions in which a urokinase compound in said solution binds to said matrix, said matrix comprising the covalently bound, carboxylated reaction product of said particulate, silicaceous matrix with polyethyleniminopropyl trimethoxy silane;

(b) separating unbound protein from said matrix; and

(c) releasing a urokinase compound from said matrix.

4,920,052

PROCESS FOR PRODUCING GLUCOSE ISOMERASE

Graham S. Byng, Elkhart, Ind., assignor to Miles Inc., Elkhart, Ind.

Filed Feb. 5, 1988, Ser. No. 152,481
Int. Cl.[5] C12N 9/92; C12R 1/01
U.S. Cl. 435—234 10 Claims

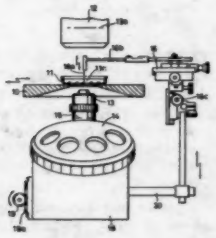
1. A process for the production of a glucose isomerase which comprises growing a culture of a Microbacterium species selected from the group consisting of *M. lacticum, M. imperiale, M. ammoniaphilum, M. laevaniformans* and glucose isomerase-producing mutants thereof in a medium containing appropriate nutrients for a sufficient time to produce a recoverable quantity of the enzyme and recovering the enzyme from the culture.

4,920,053

METHOD FOR MICROMANIPULATING CELLS BY MOVING CELL-CONTAINING VESSEL ON STAGE OF INVERTED MICROSCOPE WHILE PRICKING CELLS WITH TIP OF STYLUS

Yasuo Inoue, and Itaru Endo, both of Hachioujl, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 42,519, Apr. 27, 1987, Pat. No. 4,762,405, which is a continuation of Ser. No. 717,091, Mar. 28, 1985, abandoned. This application Apr. 28, 1988, Ser. No. 190,814
Claims priority, application Japan, Mar. 29, 1984, 59-061769
The portion of the term of this patent subsequent to Aug. 9, 2005, has been disclaimed.
Int. Cl.[5] G12M 1/00; G02B 21/32
U.S. Cl. 435—240.1 1 Claim



1. A method of a micromanipulation of some cells by pricking said cells with the tip of stylus under an inverted microscope for observation, comprising:

supporting some cells within a vessel placed on a stage of an inverted microscope;

supporting a stylus by an adjustable-length arm attached to an objective holder provided as a revolver on which at least one objective is mounted, so that said stylus is positioned above a respective said objective selected for observation in focus, by adjusting the length of said arm along the optical axis of said objective; and

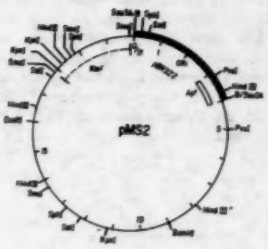
driving said objective holder to move vertically toward said cells for focusing and pricking of a sample, while moving said vessel to locate said cells consecutively one by one under said stylus.

4,920,054

SHUTTLE VECTORS FROM RHODOCOCCUS EQUI

Maya Kozlowski, Brampton, and Wayne Glasse-Davies, Limehouse, both of Canada, assignors to Allelix, Inc., Mississauga, Canada

Filed Jul. 25, 1986, Ser. No. 889,204
Int. Cl.[5] C12N 1/20, 15/00, 7/00
U.S. Cl. 435—252.31 18 Claims



1. A plasmid which c prises:

(a) a first minimal genetic region encoding an origin of plasmid replication functional in Rhodococcus; and

(b) a second minimal genetic region, encoding an origin of plasmid replication functional in at least one selected from the group consisting of *E. coli, Bacillus subtilis,* Corynebacterium, and *Staphylococcus aureus.*

11. A host transformed with a plasmid wherein said plasmid comprises:

(a) a first minimal genetic region, encoding an origin of plasmid replication functional in Rhodococcus; and

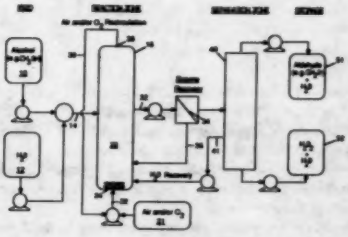
(b) a second minimal genetic region, encoding an original of plasmid replication functional in at least one selected from the group consisting of *E. coli, Bacillus subtilis,* Corynebacterium, and *Staphylococcus aureus.*

4,920,055

CONVERSION OF ALCOHOLS TO ALDEHYDES AND HYDROGEN PEROXIDE BY SUBSTRATE AND PRODUCT TOLERANT METHANOL OXIDASES

Dane A. Hoiberg, San Clemente; G. Wesley Hatfield, Corona del Mar; Harris S. Moyed, and Janice A. Sharp, both of Irvine, all of Calif., assignors to American Biogenetics Corporation, Davis, Calif.

Filed Feb. 4, 1986, Ser. No. 825,856
Int. Cl.[5] C12P 7/24, 3/00; C12N 9/04, 1/32
U.S. Cl. 435—147 47 Claims



1. A process for the enzymatic conversion of alcohol to aldehyde and hydrogen peroxide in vitro, comprising the steps of:

introducing water, lower alkyl alcohol or lower alkenyl alcohol, and extracellular methanol oxidase into a reaction

zone to form a reaction mixture, wherein said reaction mixture is substantially free from catalase activity;

oxygenating said reaction mixture by contacting at least some of the water in the reaction mixture with an oxygen-containing gas at a pressure greater than atmospheric pressure; and

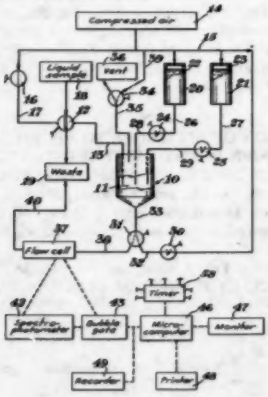
enzymatically converting said alcohol in said reaction mixture into an aldehyde and hydrogen peroxide, wherein the concentration of hydrogen peroxide in said reaction mixture after said enzymatic conversion of said alcohol is greater than about 0.5% weight/volume, wherein said methanol oxidase enzyme has an amino acid sequence that is substantially the same as that of the methanol oxidase produced by *Hansenula polymorpha* ATCC 34438 and having substantially the same product and substrate tolerance properties.

4,920,056

APPARATUS AND METHOD FOR AUTOMATED MICROBATCH REACTION

Purnendu K. Dasgupta, Lubbock, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 19, 1988, Ser. No. 158,181
Int. Cl.[5] G01N *35/00, 31/16*
U.S. Cl. 436—50 **17 Claims**



1. Apparatus for automatic microbatch reaction, comprising;

(a) a reactor defining a reaction chamber;

(b) an automatic liquid sample injection valve in fluid communication with the reaction chamber;

(c) means for automatically flowing a time - controlled variable-sized microvolume of a liquid reagent into the reaction chamber; and

(d) means for supplying gas under pressure in fluid communication with the injection valve so that a preselected microvolume of sample can be blown by said gas into the reaction chamber.

11. The apparatus of claim 10, wherein the means for mixing a liquid in the reaction chamber comprises a magnetic stirring bar positioned within the reaction chamber.

4,920,057

METHOD FOR COLORIMETRIC ANALYSIS OF METALS

Henry B. Castaneda, Woodbridge, Va., assignor to Chemetrics, Inc., Calverton, Va.

Division of Ser. No. 318,903, Mar. 3, 1989. This application Jun. 2, 1989, Ser. No. 360,256
Int. Cl.[5] G01N *33/20*
U.S. Cl. 436—77 **3 Claims**

1. A colorimetric method useful in the field for the analysis of trace levels of a dithizonate-complexing metal cation in an aqueous sample, said method comprising

extracting said metal cation from a relatively larger volume of an aqueous sample, into a relatively smaller volume by use of an organic extractant for an extractable, metal cation-dithizonate complex, of greater density than water;

allowing the resulting biphasic mixture to separate into an upper aqueous layer and a colored, lower layer of organic liquid;

while maintaining positive pressure in a hollow tubular body, passing an open end of said hollow tubular body through said upper aqueous layer into said lower organic layer;

4,920,058

METHOD OF PREDETERMINING THE WEIGHT RATIO OF ALKENYL SUCCINIMIDE REACTANTS

Frank J. DeBlase, Hopewell Junction; Daniel T. Daly, Brewster; Rodney L. Sung, and Clifton W. Wetherbee, both of Fishkill, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Mar. 13, 1989, Ser. No. 322,796
Int. Cl.[5] G01N *33/44*
U.S. Cl. 436—85 **7 Claims**

1. A method of predetermining the exact weight ratio of the reactants polyethoxy polypropoxy polybutoxy diamine and an alkenyl succinic anhydride to provide a maximum ORI additive alkenyl succinimide, said method comprising:

(a) determining by spectrometry the characteristic IR absorption of the functional groups of each reactant and that of the product desired;

(b) establishing the weight ratio to the IR absorption ratio of the reactants to produce the desired product whereby a first curve is formed of the reactant IR absorption ratio versus the reactant weight ratio;

(c) varying the weight ratio of the reactants in simulated small scale reactions of the method to produce the product and using the product characteristic IR absorption to form a second curve of the product IR absorption versus the reactant weight ratio, thereby determining the reactant weight ratio necessary to produce the maximum amount of said product;

(d) using the reactant weight ratio determined from the second curve, determine from said first curve the opti-

mum IR absorption ratio of the functional groups of said reactants; and

(e) comparing the prior measured IR absorption ratio of the reactant mixture being charged with said determined optimum reactant IR absorption ratio, whereby the exact weight ratio of the reactants is measured prior to heating and, if necessary, corrected to produce the maximum amount of the product.

4,920,059

STAINING METHOD FOR PROTEINS AND NUCLEIC ACIDS

Marc K. J. J. Moeremans, Mol; Guido F. T. Daneels, Gierle; Marc C. De Raeymaeker, Mechelen, and Jan R. De Mey, Turnhout, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Filed Jun. 12, 1985, Ser. No. 744,091

Claims priority, application United Kingdom, Jun. 22, 1984, 8415998

Int. Cl.[5] **G01N** *33/50, 33/68*

U.S. Cl. 436—86 **17 Claims**

1. A process for staining nucleic acids in or on a solid support which comprises:

(i) applying to nucleic acids which are in or on a solid support a suspension consisting essentially of colloidal metal particles, the concentration and pH of such suspension being chosen so as to provide full color saturation within an incubation time of up to one day;

(ii) allowing the colloidal metal particles to bind to the nucleic acids thereby forming stained nucleic acids having colloidal metal particles attached to binding sites thereon; and

(iii) visualizing or quantitatively determining said stained nucleic acids as a colored signal localized at said binding sites.

4,920,060

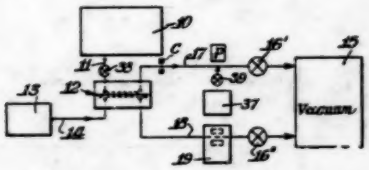
DEVICE AND PROCESS FOR MIXING A SAMPLE AND A DILUENT

George B. Parrent, Jr., Chelmsford, Mass., and Harold Hauer, Wilmington, Del., assignors to Hercules Incorporated, Wilmington, Del.

Continuation of Ser. No. 918,704, Oct. 14, 1986, abandoned. This application Apr. 8, 1988, Ser. No. 180,729

Int. Cl.[5] **G01N** *37/00*

U.S. Cl. 436—178 **11 Claims**



1. A method of controlling dilution of a sample in a measurement of the characteristics of a sample liquid in an analytical detector,

comprising the steps of

providing a supply of sample liquid,

providing a cavity having a non-wetting porous membrane and having a supply chamber on one side of said membrane and a dilution chamber on the other side of said membrane,

and having a first conduit from the sample liquid to the supply chamber and from the supply chamber to a discharge,

transporting the sample liquid through the first conduit to a first surface of said membrane at said supply chamber and from the supply chamber to the discharge,

restricting the flow of said transported sample liquid through said first conduit and supply chamber by a plurality of valve means positioned between said sample supply and the supply chamber and the supply chamber and the discharge,

controllably operating and adjusting said valve means to constrict the sample liquid to form a reservoir of sample liquid contained in the first conduit and supply chamber between said plurality of valve means,

providing means at said reservoir for variably applying pressure on said contained sample liquid in said reservoir,

controlling application of variable pressure on the sample liquid contained in the reservoir to vary and control the amounts of sample liquid transported through the membrane which is equal to or in excess of the minimum liquid entry pressure for the transport through the membrane,

passing a stream of diluent through the dilution chamber across a second surface of the membrane and a second conduit to an analyzer for sensing the properties and composition of the sample liquid in the diluent,

and said diluent stream drawing not more than minute amounts of sample through said membrane,

and applying said pressure on said sample contained in said reservoir to produce a pressure differential between pressure on the sample liquid at the first surface of the membrane and the pressure in the flowing diluent stream across the other surface in excess of the maximum liquid entry pressure differential to pass sample liquid through the membrane so that the amount of dilution of the sample liquid in the diluent is a function of said applied pressure.

4,920,061

BIOLOGICAL MAGNETIC COLLOIDS

Christopher H. Poynton, London, England, and Christopher L. Reading, Kingwood, Tex., assignors to The University of Texas System, Austin, Tex.

Continuation-in-part of Ser. No. 585,888, Mar. 2, 1984, abandoned. This application Jul. 8, 1986, Ser. No. 883,359

Int. Cl.[5] **G01N** *33/553, 33/543;* **B01F** *3/00*

U.S. Cl. 436—526 **15 Claims**

1. A colloidal biological magnetic fluid comprising a colloidal dispersed phase further comprising colloidal-sized substantially spherical paramagnetic cobalt particles coated with affinity ligands directly adsorbed to the particle surface, said colloidal dispersed phase distributed through an aqueous dispersion medium.

4,920,062

MANUFACTURING METHOD FOR VERTICALLY CONDUCTIVE SEMICONDUCTOR DEVICES

Tetsujiro Tsunoda, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed May 16, 1989, Ser. No. 352,538

Claims priority, application Japan, Oct. 19, 1988, 63-263148

Int. Cl.[5] **H01L** *21/223, 21/265*

U.S. Cl. 437—6 **9 Claims**

1. A method for manufacturing a vertical conducting power semiconductor device having cathode, anode and gate electrode, comprising the steps of:

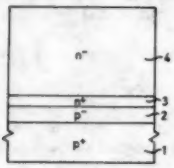
preparing a highly doped semiconductor substrate of a first conductivity type;

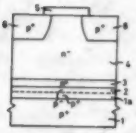
forming a first semiconductor layer on said semiconductor substrate which has a lower impurity concentration than that of said semiconductor substrate;

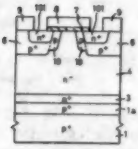
forming a highly doped second semiconductor layer of a second conductivity type in said first semiconductor layer;

forming a lightly doped third semiconductor layer of said second conductivity type on said second semiconductor layer;

forming a first impurity doped region of said first conductivity type in said third semiconductor layer which is diffused from a surface of said third semiconductor layer by a heating process; and







diffusing impurities of first conductivity type of said semiconductor substrate into said first semiconductor layer when said impurity doped region is diffused by said heating process, so as to maintain the impurity concentration of said second semiconductor layer at a constant level and substantially maintain the same thickness.

4,920,063

PROCESS FOR DETECTION OF SELECTED MOTILE ORGANISMS

N. Robert Ward, Jr., Seattle, Wash., assignor to BioControl Systems, Inc., Bothell, Wash.

Continuation-in-part of Ser. No. 621,182, Jun. 15, 1985, Pat. No. 4,563,418, which is a continuation of Ser. No. 366,978, Apr. 9, 1982, abandoned. This application Sep. 9, 1985, Ser. No. 663,201 The portion of the term of this patent subsequent to Jan. 7, 2003, has been disclaimed.

Int. Cl.[5] **G01N** *33/00*; **C12Q** *1/20*

U.S. Cl. 435—7 **21 Claims**

1. A method for detecting the presence of a particular motile organism within a sample, comprising:

inoculating a selective enrichment medium containing at least one chemotactic attractant with a sample containing the particular motile organism and one or more motile competitors, said chemotactic attractant causing motility cessation of the particular motile organism and the motile competitors within the selective enrichment medium, said enrichment medium being selective for the growth of the particular motile organism relative to the growth of the motile competitors;

contacting the selective enrichment medium containing the motile organisms with a nonselective semisolid motility medium having a gel matrix, said semisolid motility medium containing said chemotactic attractant in a concentration which is less than said initial chemotactic attractant concentration in the selective enrichment medium, and wherein the gel matrix of the semisolid motility medium remains substantially intact;

incubating the sample/selective enrichment medium under conditions which permit the motile organisms to metabolize said chemotactic attractant in said selective enrichment medium to a level which is less than said chemotactic attractant concentration in the semisolid motility medium, thereby allowing the motile organisms to move into the semisolid motility medium, said semisolid motility medium further containing antibodies specific for the particular motile organism, said antibodies being restricted to essentially unidirectional diffusion within the semisolid motility medium from a position distal to the position of the motile organisms and present in sufficient quantity to produce a persistent immobilization band upon interaction of the particular motile organism with the antibodies; and

observing the formation of the immobilization band.

4,920,064

METHOD OF MANUFACTURING AN INSULATED GATE FIELD EFFECT TRANSISTOR DMOS

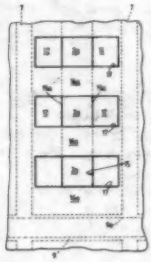
Kenneth R. Whight, Cowfold, England, assignor to U.S. Philips Corporation, New York, N.Y.

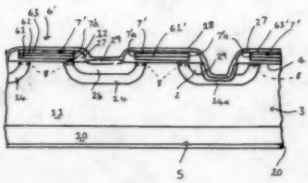
Continuation of Ser. No. 68,599, Jun. 30, 1987, abandoned. This application Apr. 18, 1989, Ser. No. 339,939

Claims priority, application United Kingdom, Aug. 8, 1986, 8619426; Dec. 20, 1986, 8630814

Int. Cl.[5] **H01L** *21/312, 21/283*

U.S. Cl. 437—41 **17 Claims**





1. A method of manufacturing an insulated gate field effect transistor comprising the steps of

providing an insulating layer on one surface of a semiconductor body, said semiconductor body being of a first conductivity type;

providing a conductive gate layer on at least portions of said insulating layer to form an insulated gate structure having at least one conductive gate region;

introducing impurities into said semiconductor body through said insulating layer in areas adjacent said insulative gate structure to form at least one source region at

said one surface within at least one body region of said semiconductor body, said source region being of a second conductivity type opposite to said first conductivity type;

forming at least one channel region below said gate region;

covering said insulated gate structure with another insulating layer by growing insulating material on said one surface of said semiconductor body;

opening at least one contact window in said another insulating layer to said one surface to expose a surface of said source region,

providing a resist layer on said another insulating layer, and patterning said resist layer to form a plurality of masking regions on said one surface over at least a portion of said source region, said masking regions extending completely across said contact window in a first direction, and said masking regions only partly covering said contact window in a second direction, said source region having at least one exposed portion defined partially by said contact window and partially by said masking regions;

etching away said exposed portion of said source region to expose underlying portions of said body region;

removing said masking regions; and

providing metallisation within said contact window to short said exposed underlying portions of said body region to said source region.

4,920,065

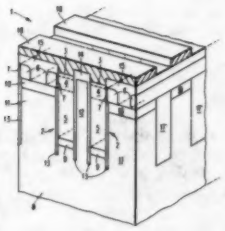
METHOD OF MAKING ULTRA DENSE DRAM CELLS

Daeje Chin, Seoul, Rep. of Korea, and Sang H. Dhong, Mahopac, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 264,418, Oct. 31, 1988, Pat. No. 4,894,697. This application Oct. 27, 1989, Ser. No. 428,100

Int. Cl.[5] H01L *21/265*

U.S. Cl. 437—52 **16 Claims**



1. A process for fabricating an ultra dense DRAM memory array comprising the steps of:

forming a first plurality of trenches in a semiconductor substrate which is spaced from an underlying substrate by an insulating layer which extends through said semiconductor substrate and said insulating layer into said underlying substrate said trenches having a given depth and extending in a given direction,

refilling said plurality of trenches with an insulating material,

forming a second plurality of trenches in said semiconductor substrate through said semiconductor substrate and said insulating layer into said underlying substrate to said given depth leaving a plurality of active device regions and simultaneously excavating portions of said insulating material from said first plurality of trenches between said second plurality of trenches to a depth less than said given depth,

refilling said second plurality of trenches and said excavated portions of said first plurality of trenches with a conductive material, removing said conductive material from said excavated portions of said first plurality of trenches to expose the surfaces of said insulating material therein and from selected of said second plurality of said refilled trenches to a depth below said depth less than said given depth to form a plurality of flat topped regions of said conductive and said insulating materials which extend in a direction orthogonal to said given direction,

oxidizing said plurality of flat topped regions of conductive material such that the tops of the resulting insulating oxide are at the same level as the tops of said flat topped regions of insulating material forming a plurality of gate conduits extending in a direction orthogonal to said given direction,

forming a pair of conductive gate elements in each of said gate conduits each of said conductive gate elements being disposed in insulted spaced relationship with adjacent active device regions of said plurality of active device regions.

4,920,066

PROCESS FOR FABRICATING A HIGH-SPEED CMOS TTL SEMICONDUCTOR DEVICE

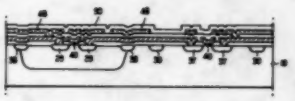
Pil-Young Hong, Einchun; Tae-Yop Oh; Chun-Joong Kim, both of Seoul, and Sang-Suk Kang, Kyoungsangbuk, all of Rep. of Korea, assignors to Samsung Electronic Co. Ltd., Suwon, Rep. of Korea

Filed Dec. 30, 1988, Ser. No. 292,106

Claims priority, application Rep. of Korea, Dec. 31, 1987, 1987-15551

Int. Cl.[5] H01L *21/265*

U.S. Cl. 437—57 **10 Claims**



1. A process for fabricating a semiconductor device, comprising the steps of:

forming a second conductivity type well region over a first conductivity type silicon semiconductor substrate;

forming successively a first oxide layer and a nitride layer over said substrate;

selectively removing portions of said nitride layer over a first MOS transistor region on said well region, a second transistor region on said substrate, and channel-stop regions around said second transistor region;

forming a field oxide layer in the first MOS transistor, second transistor and channel-stop regions exposed by said step of selectively removing portions of said nitride layer,

forming drain and source of said first MOS transistor over said well region, and stop-channel regions in said substrate;

forming ohmic contact regions in an edge of said well region, and drain and source of said second MOS transistor between said stop-channel regions over said substrate;

forming a second oxide layer on the whole surface of said substrate to form a gate oxide layer after removing said nitride layer and said first oxide layer of the gate regions of said first and second MOS transistors;

forming contact windows for contacting the source and drain of said first and second MOS transistors;

forming a pattern of a first metal layer to form electrodes of said first and second MOS transistors;

forming a pattern of low temperature oxide layer over said first metal layer to insulate a specified portion;

forming a pattern of a second metal layer connected with first metal layer through said contact windows, being insulated from said first metal layer by said low temperature oxide layer; and

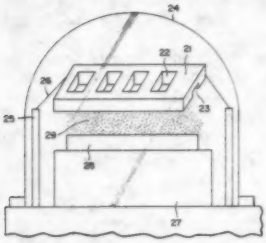
forming a protection layer over said second metal layer.

4,920,067

PROCESS FOR II-VI COMPOUND EPITAXY

Jamie Knapp, 3909 E. Hampton Pl., Tuscon, Ariz. 85712

Filed Oct. 5, 1988, Ser. No. 253,609
Claims priority, application Israel, Oct. 7, 1987, 84118
Int. Cl.[5] H01L *21/20, 21/203, 21/205, 21/208*
U.S. Cl. 437—81 8 Claims



1. A process for the production of epitaxial layers of II–VI compound semiconductors on suitable substrates, wherein the epitaxial growth from a melt is effected on such substrates using graphite susceptor devices, where the surfaces of the graphite exposed to the reactants are coated with an essentially pure and uniform layer of essentially silicon mono-oxide applied to such graphite by plasma sputtering.

4,920,068

METALORGANIC VAPOR PHASE EPITAXIAL GROWTH OF GROUP II-VI SEMICONDUCTOR MATERIALS

Donald Valentine, Jr., Ridgefield, and Duncan W. Brown, Wilton, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Apr. 2, 1986, Ser. No. 847,370
Int. Cl.[5] H01L *21/20*
U.S. Cl. 437—81 2 Claims

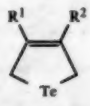
1. In a method for growing in a reactor a Group II–VI epitaxial layer over a crystalline substrate or over a crystalline substrate having one or more epitaxial layers thereon, said method comprising the steps of:

(i) placing said substrate on a susceptor which is heated to a temperature in the range from about 220° C. to about 300° C.;

(ii) directing a flow of at least one vaporized Group II component toward said substrate;

(iii) directing a flow of a vaporized Group VI metal-organic toward said substrate; and

(iv) reacting the directed flows of Group II component and Group VI metalorganic to form the epitaxial layer, the improvement which comprises using as said Group VI metalorganic a tellurium compound of the formula:



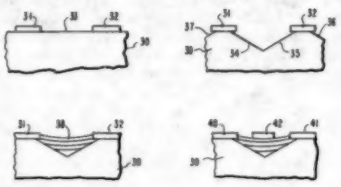
wherein R^1 and R^2 are, independently hydrogen or alkyl of from 1 to about 4 carbon atoms.

4,920,069

SUBMICRON DIMENSION COMPOUND SEMICONDUCTOR FABRICATION USING THERMAL ETCHING

Eric R. Fossum, Yorktown Heights; Peter D. Kirchner, Garrison; George D. Pettit, Mahopac; Alan C. Warren, Peekskill, and Jerry M. Woodall, Bedford Hills, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 12,463, Feb. 9, 1987, abandoned. This application Apr. 15, 1988, Ser. No. 183,489
Int. Cl.[5] H01L *21/20*
U.S. Cl. 437—90 12 Claims



1. A method for fabricating semiconductor devices comprising the steps of:

providing a compound semiconductor substrate the surface of which has a given crystallographic orientation,

aligning mask portions on the surface of said substrate such that their edges are aligned in a direction parallel to the line of intersection of intersecting planes obtained by the more rapid erosion of said substrate in the vertical direction than in the lateral direction and such that portions of said surface are exposed, and,

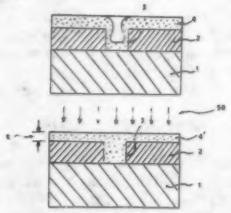
anisotropically etching said exposed surface portions by vapor chemical erosion such that at least a portion of each of said planes is exposed to form at least a portion of a v-grooved channel.

4,920,070

METHOD FOR FORMING WIRINGS FOR A SEMICONDUCTOR DEVICE BY FILLING VERY NARROW VIA HOLES

Ryoichi Mukai, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 27, 1987, Ser. No. 127,042
Claims priority, application Japan, Feb. 19, 1987, 62-036303; Feb. 27, 1987, 62-046031
Int. Cl.[5] H01L *21/268, 21/283*
U.S. Cl. 437—173 26 Claims



1. A method for fabricating a semiconductor device, comprising the steps of:

(a) forming an insulating layer on a semiconductor substrate;

(b) forming a recess, having a width of less than 1.0 micrometer and an aspect ratio of more than 1.0, in the insulating layer;

(c) depositing metal material by sputtering on the insulating layer and in the recess for forming a layer of the metal material having a first thickness; and

(d) irradiating a pulsed energy beam over the layer of the metal material on the insulating layer for melting the metal material to form a planarized metal layer extending from the metal material filled in the recess over the insulating layer, the first thickness being such that the planarized metal layer has a thickness more than 0.5 micrometers in the vicinity of the recess.

4,920,071

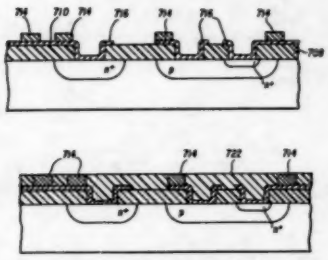
HIGH TEMPERATURE INTERCONNECT SYSTEM FOR AN INTEGRATED CIRCUIT

Michael E. Thomas, Cupertino, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Continuation of Ser. No. 712,589, Mar. 15, 1985, abandoned. This application Aug. 18, 1987, Ser. No. 86,200

Int. Cl.[5] H01L *21/283*

U.S. Cl. 437—188 **4 Claims**



1. A method of inhibiting silicon transport from a doped silicon junction to a refractory metal contact in a semiconductor device by interposing a diffusion barrier layer of material selected from the group consisting of refractory metal nitrides, refractory metal borides and refractory metal carbides, between said doped silicon junction and said refractory metal contact, said method comprising the steps of:

(a) forming a metal disilicide region in a contact region of said semiconductor device including the steps of:

(i) depositing a layer of refractory metal into said contact regions; and

(ii) heating said device; and

(b) forming said diffusion barrier layer by converting at least a portion of said metal disilicide region to said barrier layer material including the steps of:

(i) removing substantially all unreacted refractory metal; and

(ii) heating said device in a gaseous element bearing ambient, said element selected from the group consisting of nitrogen, boron and carbon.

4,920,072

METHOD OF FORMING METAL INTERCONNECTS

Stephen A. Keller; Piper A. Spry, both of Sugar Land; Martha S. Adams, Rosenberg, and Ralph G. Harper, Guy, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 31, 1988, Ser. No. 265,157

Int. Cl.[5] H01L *21/285*

U.S. Cl. 437—192 **5 Claims**

1. A method of forming metal interconnects comprising the steps of:

providing a non planarized semiconductor body having active devices formed thereon;

depositing spin-on-glass on said semiconductor body;

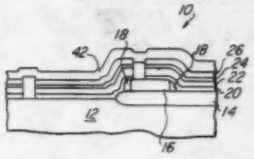
depositing a barrier layer material over said spin-on-glass;

depositing a metal layer over said barrier layer;

forming a photoresist layer over said metal layer and patterning said photoresist for contact formation;

etching said contact pattern into said barrier and metal layers;

removing said photoresist;



further etching said contact pattern to the underlying devices;

depositing a conformal layer of CVD tungsten over said semiconductor body to fill said contact openings;

etching back said tungsten without photoresist using said metal layer as an etch stop to prevent over etching;

stripping said metal layer; and

depositing a metalization layer.

4,920,073

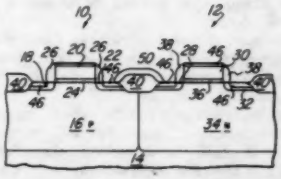
SELECTIVE SILICIDATION PROCESS USING A TITANIUM NITRIDE PROTECTIVE LAYER

Che-Chia Wei, Plano; Thomas E. Tang, Dallas; James G. Bohlman, Forney, and Monte A. Douglas, Coppell, all of Tex., assignors to Texas Instruments, Incorporated, Dallas, Tex.

Filed May 11, 1989, Ser. No. 350,429

Int. Cl.[5] H01L *21/283*

U.S. Cl. 437—200 **8 Claims**



1. A method for forming high conductivity regions in selected regions of a silicon integrated circuit, comprising the steps of:

depositing a layer of titanium overall said silicon integrated circuit;

depositing a layer of titanium nitride on said layer of titanium;

heating said integrated circuit to a temperature sufficient to cause said layer of titanium to react with said selected regions of said silicon integrated circuit to form titanium silicide;

patterning and etching said layer of titanium nitride to provide conductive titanium nitride connection between elements of said integrated circuit said etching removing said layer of titanium nitride from above said titanium silicide where said silicide is not in contact with said conductive connection;

4,920,074

SURFACE MOUNT PLASTIC PACKAGE SEMICONDUCTOR INTEGRATED CIRCUIT, MANUFACTURING METHOD THEREOF, AS WELL AS MOUNTING METHOD AND MOUNTED STRUCTURE THEREOF

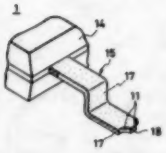
Ichio Shimizu, Tamamura; Akio Hoshi, Isesaki; Sumio Okada, Takasaki, and Soichiro Nakamura, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 25, 1988, Ser. No. 160,177

Claims priority, application Japan, Feb. 25, 1987, 62-40267; Aug. 20, 1987, 62-207163

Int. Cl.[4] H01L *29/78*

U.S. Cl. 437—211 **15 Claims**



1. A process for manufacturing a surface mount resin-encapsulated semiconductor device using a lead frame formed from a metal film into a predetermined shape, wherein the process comprises the steps of:

(a) forming a plurality of resin encapsulating bodies, each having paired main upper and lower surfaces, each resin encapsulating body encapsulating a corresponding semiconductor device, the plurality of resin encapsulating bodies being formed at a plurality of predetermined locations of a lead frame comprising a frame member and leads, each of the leads having a lead part, including a free end, protruding out from a resin encapsulating body, the frame member and leads being connected via connecting portions extending between the frame member and leads, each of the leads and the connecting portions having a cross-sectional area, the cross-sectional area of the connecting portions being smaller than the cross-sectional area of the leads;

(b) forming a soldering layer on the surface of said lead frame subsequent to forming the plurality of resin encapsulating bodies;

(c) disconnecting each lead and the frame member at the connecting portions between said frame member and each of the leads, subsequent to the step of forming the soldering layer; and

(d) shaping the free end, and the vicinity thereof, of each of the leads into such a shape that the free end and vicinity thereof is situated at a position below the main lower surface of the resin encapsulating body from which the respective lead protrudes, substantially in parallel with the main surface of the resin encapsulating body and extending away from said encapsulating body.

4,920,075

METHOD FOR MANUFACTURING A SEMICONDUCTOR DEVICE HAVING A LENS SECTION

Shigeru Morita, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 504,123, Jun. 14, 1983, abandoned. This application Jan. 7, 1987, Ser. No. 4,759

Claims priority, application Japan, Jun. 15, 1982, 57-102831

Int. Cl.[5] H01L *21/08*

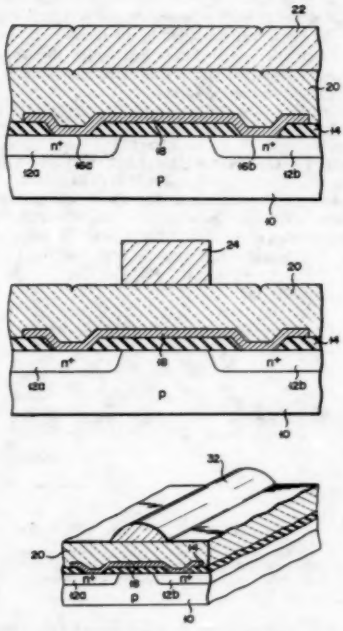
U.S. Cl. 437—228 **8 Claims**

1. A method for manufacturing an integrated semiconductor device with a lens section comprising the steps of:

forming a semiconductor element in a semiconductor substrate;

forming a transparent layer over said semiconductor element;

etching said transparent layer to form a block structure over said semiconductor element; and



thermally treating said block structure to form said lens section therefrom to a predetermined curvature.

4,920,076

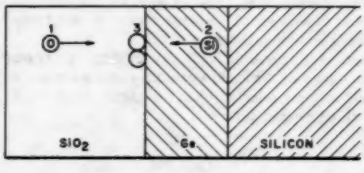
METHOD FOR ENHANCING GROWTH OF SiO_2 IN SI BY THE IMPLANTATION OF GERMANIUM

Orin W. Holland, Oak Ridge; Dariush Fathy, Knoxville, and Clark W. White, Oak Ridge, all of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 15, 1988, Ser. No. 181,899

Int. Cl.[5] H01L *21/473*

U.S. Cl. 437—238 **11 Claims**



PROCESS
(1) OXYGEN DIFFUSION THROUGH OXIDE
(2) SILICON DIFFUSION THROUGH Ge
(3) FORMATION OF SiO_2 AT THE INTERFACE

1. A process for enhancing the thermal oxidation rate of a selected surface portion of a silicon substrate, comprising the steps of:

providing a substrate consisting essentially of a single crystal of silicon and having a surface portion to be oxidized;

forming a surface epitaxial layer consisting essentially of

germanium for providing a concentration of germanium in a near surface region in said silicon substrate at said surface portion to be oxidized sufficient to form at least one uniform monolayer of germanium coextensive with said surface portion to be oxidized during a subsequent heating step; and

heating said substrate in an oxidizing atmosphere containing H_2O for effecting thermal oxidation of said surface portion and forming an essentially uniform epitaxial layer of germanium at least one monolayer in thickness at an interface between said substrate and a layer of silicon dioxide formed by said oxidation and with continuing heating of said substrate in said oxidizing atmosphere containing H_2O for providing enhanced growth rate of said silicon dioxide layer at said surface portion due to the presence of the underlying uniform layer of germanium.

4,920,077

METHOD OF MANUFACTURING MONOLYTHIC INTEGRATED CIRCUITS

Marco Mora, Bergamo, Italy, assignor to SGS-Thomson Microelectronics S.r.L., Milan, Italy

Filed Sep. 27, 1988, Ser. No. 249,788

Claims priority, application Italy, Oct. 9, 1987, 22216 A/87

Int. Cl.[5] H01L *21/00, 21/02, 21/285, 21/90*

U.S. Cl. 437—240 **7 Claims**

1. A method of manufacturing monolythic integrated circuits, comprising a process step of aluminum annealing and a process step of final passivation, characterized in that said steps are carried out at least in part simultaneously at a pressure of 1 to 1.5 Torr and a temperature of about 450° C.

4,920,078

ARSENIC SULFIDE SURFACE PASSIVATION OF III-V SEMICONDUCTORS

Brian G. Bagley, Watchung; Thomas J. Gmitter, Lakewood, and Eli Yablonovitch, Leonardo, all of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed Jun. 2, 1989, Ser. No. 360,414

Int. Cl.[5] H01L *21/00, 21/02, 21/302;* **B05D** *5/12*

U.S. Cl. 437—243 **21 Claims**

1. A method for passivating a semiconductor, comprising:

coating a film of a chalcogenide glass on a semiconductor substrate, said coating step including cleaning said substrate with a basic solution, wherein said film is coated on said substrate in a form of a precursor of said chalcogenide glass while said substrate is at a coating temperature below a melting temperature of said chalcogenide glass; and

heating said precursor coated substrate at an annealing temperature above a glass transition temperature of said chalcogenide glass.

4,920,079

PROCESS FOR ISOSTATICALLY PRESSING EXPLOSIVE CHARGES

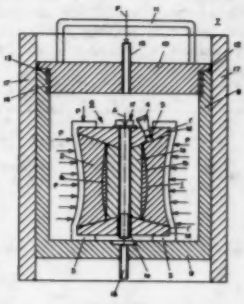
Rudolf Kaeser, Thun, and Jurg Meister, Steffisburg, both of Switzerland, assignors to Schweizerische Eidgenossenschaft Vertreten Durch: Eidg. Munitionsfabrik Thun Der Gruppe Fur Rustendienste, Thun, Switzerland

Filed Jun. 8, 1988, Ser. No. 204,004

Claims priority, application Switzerland, Jun. 17, 1987, 02270/87

Int. Cl.[5] C06B *21/00*

U.S. Cl. 264—3.1 **9 Claims**



1. A process for isostatically pressing high-performance explosive bodies of high dimensional stability and high degree of homogeneity, said process comprising sealingly engaging an elastic sleeve to the largest edge zone of a mold member to define a loadable compression mold cavity therebetween, said mold member being a dimensionally stable body having a high quality surface thereof and at least in part being rotationally symmetric and having a finite slope relative to the axis of rotation of the rotationally symmetric part of the body, filling the cavity of the compression mold with powdered explosive, evacuating gas from the filled compression mold and while the cavity is evacuated sealing the cavity against the passage of gas thereinto, subjecting the exterior of the sealed, evacuated, filled compression mold to fluid pressure at a pressure which is increased continuously until a predetermined value of explosive density is achieved to form a pressed explosive body, returning the pressurized compression mold to ambient pressure by continuous pressure relief, and removing the pressed explosive body from the compression mold.

4,920,080

METHOD OF MAKING GLASS WITH PRELIMINARY REACTION OF BATCH MATERIALS

Henry M. Demarest, Jr., Natrona Heights, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 19, 1988, Ser. No. 233,707

Int. Cl.[5] C03C *6/04*

U.S. Cl. 501—31 **10 Claims**

1. A method of making glass from batach materials including a silica source material, sodium carbonate, and a source of calcium, comprising:

contacting a first portion of the silica sosurce material with the sodium carbonatae in a first pre-reaction zone at a sufficient temperature for a sufficient time to form a product consisting predominantly of sodium silicate;

heating a second portion of the silica source with a carbonate source of calcium in a second pre-reaction zone to at least a temperature sufficient to render the calcium source substantially free of carbonates;

bringing the products at elevated temperataures from the first and second pre-reaction zones into contact with each

other and heating the combined products in a third zone so as to initiate melting of glass.

4,920,081
R_2O-AL_2O_3/B_2O_3-P_2O_5 GLASSES
George H. Beall, Big Flats, and Candace J. Quinn, Corning, both of N.Y., assignors to Corning Incorporated, Corning, N.Y.
Filed Oct. 17, 1988, Ser. No. 258,674
Int. Cl.[5] C03C *3/16, 3/17, 3/19, 3/21*
U.S. Cl. 501—47 1 Claim

1. A glass exhibiting a transition temperature below 350° C., a working temperature below 450° C., and excellent resistance to attack by water and mild aqueous alkaline solutions, said glass consisting essentially, expressed in terms of mole percent on the oxide basis, of:

P_2O_5	41–57	Li_2O	0–21
Al_2O_3	0–5	$Na_2O + Li_2O$	13.8–43
B_2O_3	0–9	Cu_2O	0–12
$Al_2O_3 + B_2O_3$	3–9.5	$Li_2O + Cu_2O$	10–29
Na_2O	15–24	ZrO_2	0–2.8
CaO	0–8	F_2	0–5.5
MgO	0–2	K_2O	0–5.5

$P_2O_5 + Al_2O_3 + B_2O_3 + Na_2O + Li_2O + Cu_2O > 90$.—

4,920,082
GLASSES EXHIBITING CONTROLLED FLUORIDE RELEASE
Paul S. Danielson, Corning, N.Y., assignor to Corning Incorporated, Corning, N.Y.
Continuation-in-part of Ser. No. 304,014, Jan. 30, 1989, abandoned. This application Oct. 25, 1989, Ser. No. 427,181
Int. Cl.[5] C03C *3/118*
U.S. Cl. 501—59 6 Claims

1. A translucent, phase separated, fluoride-containing glass wherein the phase separated droplets do not exceed about 1400Å in size and wherein, upon exposure to an aqueous environment, fluoride ions will be released therefrom at a controlled, relatively constant rate over a substantial period of time, but with essentially no development of porosity or other physical breakdown effect, and which can be melted and formed with relatively low volatilization of fluorine, said glass being essentially free of alkali metal oxides and heavy toxic metals and consisting essentially, expressed in terms of weight percent of:

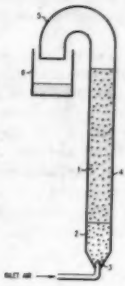
SiO_2: 41.4–55.9
BaO: 24.7–33.6
Al_2O_3: 5.6–11
B_2O_3: 6.5–10.3
F: 3–6.

4,920,083
NOVEL PROCESS FOR THE PRODUCTION OF CERAMIC FLAKES
Venugopal B. Menon, Chapel Hill, N.C., assignor to Research Triangle Institute, Research Triangle Park, N.C.
Filed May 18, 1988, Ser. No. 195,649
Int. Cl.[5] C04B *35/48*
U.S. Cl. 501—84 20 Claims

1. A method for the production of ceramic oxide flakes, comprising the steps of:

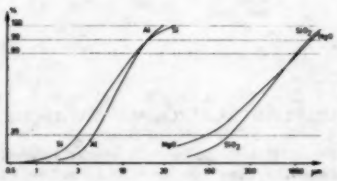
(i) preparing a colloidal foam by blowing a gas into an aqueous solution comprising a precursor salt of said ceramic oxide flake and a surfactant;

(ii) precipitating flakes of said precursor salt in said colloidal foam; and



(iii) drying and calcining said precipitated flakes to produce said ceramic oxide flakes.

4,920,084
FORMING REFRACTORY MASSES AND COMPOSITION OF MATTER FOR USE IN FORMING SUCH REFRACTORY MASSES
Pierre Robyn, Nivelles; Léon-Philippe Mottet, Tarcienne, and Pierre Deschepper, Marcinelle, all of Belgium, assignors to Glaverbel, Brussels, Belgium
Division of Ser. No. 803,782, Dec. 2, 1985, Pat. No. 4,792,468. This application Oct. 6, 1988, Ser. No. 239,175
Claims priority, application United Kingdom, Jan. 26, 1985, 8502008
Int. Cl.[5] C04B *35/00, 35/62*
U.S. Cl. 501—94 16 Claims



1. A composition of matter for spraying against a surface to form a refractory mass, such composition being a mixture comprising refractory particles, together with particles of exothermically oxidisable material, wherein the exothermically oxidisable particles are present in an amount between 5% and 30% by weight of said mixture and the granulometry of said particles is such that the mean of the 80% and 20% grain sizes of the refractory particles is greater than the mean of the 80% and 20% grain sizes of the oxidisable particles and that the size range spread factor, f(G), of the refractory particles is at least 1.2 wherein the % grain size of the particles of material denotes that % proportion by weight of the particles which will pass a screen having a mesh of that size, and the mean of two % grain sizes refers to half of the sum of those grain sizes, and

$$f(G) = \frac{2(G_{80} - G_{20})}{G_{80} + G_{20}}$$

where G_{80} denotes the 80% grain size of particles of that species and G_{20} denotes the 20% grain size of particles of that species.

4,920,085

SILICON NITRIDE SINTERED BODY AND PROCESS FOR PREPARATION THEREOF

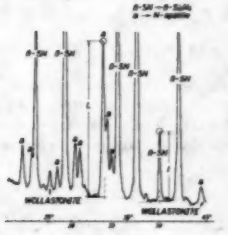
Makoto Yoshida; Masahiro Sato; Kazunori Koga; Kazumi Osamura; Shoji Kousaka; Tatsumi Maeda; Kiyoshi Yokoyama, and Masafumi Matsunaka, all of Kokubu, Japan, assignors to Kyocera Corporation, Kyoto, Japan

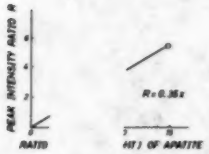
Filed Apr. 1, 1988, Ser. No. 176,605

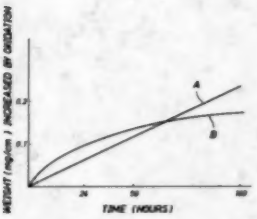
Claims priority, application Japan, Apr. 2, 1987, 62-82077; Apr. 2, 1987, 62-82078; Apr. 9, 1987, 62-87842; May 9, 1987, 62-113104; May 20, 1987, 62-124663; Jun. 2, 1987, 62-138782; Aug. 31, 1987, 62-218341; Nov. 30, 1987, 62-304135

Int. Cl.[5] C04B *35/58*

U.S. Cl. 501—97 12 Claims







1. A silicon nitride sintered body comprising 85 to 99 mole % of β-Si_3N_4, 1 to 5 mole % of at least one oxide (M_2O_3) of an element (M) selected from the group consisting of Sc, Yb, Er, Ho and Dy and less than 10 mole % of excessive oxygen (O_2), in the form of SiO_2, based on the three components, the excessive oxygen in the form of SiO_2/M_2O_3 molar ratio being lower than 2, wherein said body comprises grains of Si_3N_4 and a grain boundary comprising a vitreous phase and a crystal phase consisting of $M_4Si_2O_7N_2$ or a major amount of $M_4Si_2O_7N_2$ and a minor amount of at least one of $MSiO_2N$ and $M_{10}Si_7O_{23}N_4$.

3. A silicon nitride sintered body comprising 85 to 99 mole % of β-Si_3N_4, 1 to 5 mole % of at least one oxide (M_2O_3) of an element (M) selected from the group consisting of Sc, Yb, Er, Ho and Dy and less than 10 mole % of excessive oxygen (O_2) in the form of SiO_2 based on the three components, the excessive oxygen in the form of SiO_2/M_2O_3 molar ratio being lower than 2, wherein said body comprises grains of Si_3N_4 and a grain boundary comprising a vitreous phase and a crystal phase comprising a major amount of $MSiO_2N$.

4,920,086

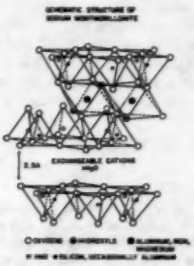
MIXED PILLARED CLAY REDUCTION PRODUCTS AND METHOD OF PREPARATION

Rasik H. Raythatha, 329 Franklin St., Tenville, Ga. 31489; Bruce Tatarchuk, Rte. 2, Box 189F, Auburn, Ala. 36830, and Woo Y. Lee, 500 Northside Cir., Apt. Q9, Atlanta, Ga. 30309

Continuation-in-part of Ser. No. 70,433, Jul. 7, 1987, abandoned. This application Apr. 11, 1988, Ser. No. 180,342

Int. Cl.[5] B01J *29/06, 21/16*

U.S. Cl. 502—63 15 Claims



1. A method of making a catalytic composition which comprises preparing a mixed pillared clay by steps including forming an aluminum hydroxy polymer and forming a transition metal hydroxy polymer, in the liquid phase, and mixing said liquid phase polymers with a swelling clay to form a mixed pillared clay, using a proportion of each individual polymer that will satisfy a selected percentage of the cation exchange capacity of the clay, and subjecting the mixed pillared clay to a reducing atmosphere to produce metallic transition metal domains.

4,920,087

VANADIUM SCAVENGING COMPOSITIONS

Richard F. Wormsbecher, Baltimore, Md., assignor to W. R. Grace & Co.-Conn., New York, N.Y.

Continuation of Ser. No. 739,645, May 31, 1985, abandoned, which is a continuation-in-part of Ser. No. 487,165, Apr. 21, 1983, abandoned, and Ser. No. 689,280, Jan. 7, 1985, abandoned. This application Mar. 9, 1988, Ser. No. 165,696

Int. Cl.[5] B01J *21/08, 21/10*

U.S. Cl. 502—68 12 Claims

1. A composition for scavenging vanadium during the catalytic cracking of hydrocarbons comprising a magnesia-silica gel having the weight composition 30 to 80 percent MgO and a pore volume of at least 0.1 cc/g in intra-particle pores having an average pore diameter greater than about 600 Å in pores ranging from about 200 to 10,000 Å in diameter.

3. In a catalyst for the catalytic cracking of vanadium containing hydrocarbons wherein said catalyst comprises synthetic faujasite dispersed in an inorganic oxide matrix and a composition for scavening vanadium, the improvement comprising from about 5 to 80 percent by weight expressed as the oxides of a composition for scavenging vanadium which comprises a magnesia-silica gel having the weight composition 30 to 80 percent MgO, and a pore volume of at least 0.1 cc/g in intra-particle pores having an average pore diameter greater than about 600 Å in pores ranging from about 200 to 10,000 Å in diameter.

4,920,088
CATALYST FOR THE OXIDATION OF CARBON MONOXIDE

John W. Kolts, Ochelata, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 94,467, Sep. 21, 1987, abandoned. This application May 6, 1988, Ser. No. 192,264

Int. Cl.[5] B01J *21/06, 23/42, 23/44, 23/89*

U.S. Cl. 502—326 **87 Claims**

1. A composition of matter consisting essentially of (i) a support material consisting essentially of titania, (ii) platinum metal and (iii) iron oxide,

wherein said composition of matter is active as a catalyst for the oxidation of carbon monoxide with free oxygen to carbon dioxide at about 10°–50° C., and said composition of matter contains components (ii) and (iii) in amounts such that said iron oxide is effective as copromoter for said platinum metal on said support material in said oxidation at about 10°–50° C.

4,920,089
HYDROGENATION CATALYST

Wilhelmus P. Van Beek, Vlaardingen; Wilma Den Hoed, Papendrecht; Willem A. Van Leeuwen, Vlaardingen; Eduard K. Poels, Leyden, and Cornelis Visser, Zwijndrecht, all of Netherlands, assignors to Unilever Patent Holdings B.V., Rotterdam, Netherlands

Filed May 3, 1988, Ser. No. 192,217

Claims priority, application European Pat. Off., May 8, 1987, 87200855.2

Int. Cl.[5] B01J *21/04, 23/74*

U.S. Cl. 502—335 **5 Claims**

1. A nickel upon transition alumina catalyst containing 5–40% ww of nickel, with an active nickel surface area between 80 and 300 m^2/g of Ni, characterized in that the transition alumina is substantially free for pores with a radius below 2.0 nm, has a pore size distribution substantially between 3.5 and 30 nm, and satisfies the following x-ray diffraction pattern:

d (10^{-10} m)	I/Io
1.39	100
2.85	75–85
2.72	60–80
2.43	70
2.01	45–80

4,920,090
PROCESS FOR THE FORMATION OF SHAPED AGGLOMERATES FROM PARTICULATE SOLIDS

Wolfgang Ritter, Haan; Hans-Peter Handwerk, Duesseldorf, and Franz-Josef Carduck, Haan, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 193,973, May 13, 1988, Pat. No. 4,866,023. This application Dec. 5, 1988, Ser. No. 280,400

Claims priority, application Fed. Rep. of Germany, May 15, 1987, 3716286; Dec. 7, 1987, 3741337

Int. Cl.[5] B01J *32/00*

U.S. Cl. 502—439 **20 Claims**

1. A process for making a shaped agglomerate from finely divided solid particles, comprising the steps of:

(a) mixing the solid particles with a first carrier liquid phase comprising a solution of binder precursor polymer molecules that contain anhydrides of dicarboxylic acids, said solid particles being less than fully soluble in and chemically non-reactive with said first carrier liquid phase;

(b) shaping the dispersion formed in step (a) into the desired shape for the final agglomerate; and

(c) reacting the shaped body formed in step (b) with an effective quantity of anhydride-reactive polyamine molecules to harden at least a surface zone of the shaped body formed in step (b) by converting the binder precursor polymer molecules in this zone to binder polymer molecules, said binder polymer, as a result of reaction between the anhydride and the polyamine, containing sufficient cyclic imide groups and being present in sufficient amount so that the shaped body as a whole detectably absorbs infrared light selectively at about 1770 and about 750 wave numbers.

4,920,091
RECORDING MATERIAL

Ken Iwakura; Shojiro Sano; Masato Satomura; Koreshige Ito, and Katsumi Matsuoka, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

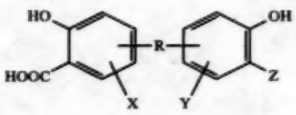
Filed Dec. 27, 1988, Ser. No. 290,669

Claims priority, application Japan, Dec. 25, 1987, 62-329268; Mar. 14, 1988, 63-59919; Mar. 14, 1988, 63-59920; Jul. 8, 1988, 63-170546

Int. Cl.[5] B41M *5/16, 5/18, 5/20*

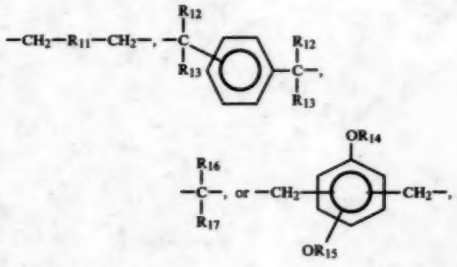
U.S. Cl. 503—211 **13 Claims**

1. A recording material comprising a support having thereon at least one electron donating colorless dye and at least one electron accepting compound, wherein the electron accepting compound is a salicylic acid compound represented by formula (I):

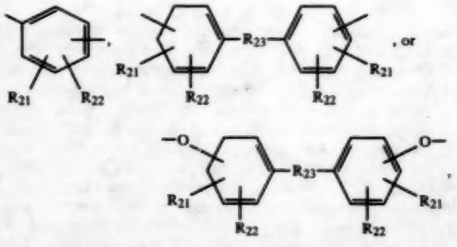


(I)

wherein R represents



wherein R_{11} represents



wherein R_{21} and R_{22}, which may be the same or different, each represents a hydrogen atom, an alkyl group, an alkoxy group, a halogen atom, an aryl group, or a hydroxyl group; and R_{23} represents an alkylene group or an aralkylene group; R_{12} and

R_{13} each represents a hydrogen atom, an alkyl group, or an aryl group, provided that R_{12} and R_{13} do not simultaneously represent a hydrogen atom; R_{16} and R_{17} each represents a hydrogen atom, an alkyl group, or an aryl group, provided that at least one of them is an aryl group and that the sum of the carbon atom number of R_{16} and R_{17} is 7 or more; R_{14} represents a hydrogen atom or an organic residual group; and R_{15} represents a hydrogen atom, an alkyl group, an alkoxy group, or a halogen atom; X and Y, which may be the same or different, each represents a hydrogen atom, an alkyl group, an aryl group, an alkoxy group, or a halogen atom; and Z represents a hydrogen atom, a carboxyl group, an alkyl group, an aryl group, an alkoxy group, or a halogen atom, or a metal salt thereof.

4,920,092

DYESHEETS

Roger J. Davey, Hoole Chester, and Duncan H. MacKeron, Frodsham, both of England, assignors to Imperial Chemical Industrices PLC, London, England

Filed Jun. 6, 1988, Ser. No. 202,588

Claims priority, application United Kingdom, Jun. 5, 1987, 8713242

Int. Cl.[5] B41M *5/035, 5/26*

U.S. Cl. 503—227 **5 Claims**

1. A thermal transfer dye sheet, comprising a supportive based material coated with a composition of a thermally transferable dye dispersed uniformly throughout a polymeric binder matrix, wherein the composition also contains a crystallisation inhibitor having a molecular structure consisting essentially of a polymer backbone to which are chemically bonded a multiplicity of groups which have one of (a) essentially the same chemical structure as the individual thermally transferable dye molecules and (b) a chemical structure which represents a substantial portion of the individual thermally transferable dye molecules, said substantial portion being sufficient to mimic the crystallisation behavior of said thermally transferable dye.

4,920,093

FABRICATION OF SUPERCONDUCTING OXIDE THIN FILMS BY SOL-GEL METHOD

Toshihisa Nonaka, Osaka; Keisuke Kobayashi, Shiga; Hiroyuki Igaki, Shiga, and Michiyasu Matsuki, Shiga, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed May 26, 1988, Ser. No. 200,515

Claims priority, application Japan, May 29, 1987, 62-131093; Jul. 24, 1987, 62-186304; Jan. 25, 1988, 63-14009

Int. Cl.[5] B05D *5/12;* **C01F** *17/00;* **C04B** *35/05*

U.S. Cl. 505—1 **32 Claims**

1. A method of forming a superconductive thin film comprising:

a step of preparing a solution containing an amount (a) of mols of at least one compound selected from the group A consisting of methoxide, ethoxide, propoxide, butoxide, methoxyethoxide and ethoxyethoxide of La; an amount (b) of mols at least one compound selected from the group B consisting of methoxide, ethoxide, propoxide, butoxide, methoxyethoxide and ethoxyethoxide of a metal selected from Ba, Sr and Ca; an amount (c) of mols of at least one compound selected from the group C consisting of methoxide, ethoxide, propoxide, butoxide, methoxyethoxide and ethoxyethoxide of Cu; an amount (d) of mols for inhibiting hydrolysis of at least one compound selected from the group D consisting of monoethanolamine, diethanolamine, triethanolamine, mono-2-propanolamine, di-2-propanolamine, acetylacetone, ethylene glycol, diethylene glycol, propylene glycol and dipropylene glycol; and an amount (e) of liters of at least one compound selected from the group E consisting of methanol, ethanol, propanol, butanol, methoxyethanol and ethoxyethanol; said amounts (a)–(e) satisfying the following equations:

$$0.1\times(a+b+c)\leq d\leq 3\times(a+b+c) \text{ and}$$
$$0.01\leq\{(a+b+c)/e\}\leq 3;$$

a step of forming a thin film of the solution as prepared above on a heat-resistant substrate;

a step of drying the film thus formed; and

a step of calcining said film in an oxidative atmosphere at 350° to 1,150° C. to make said film superconductive.

4,920,094

PROCESS FOR PRODUCING SUPERCONDUCTING THIN FILMS

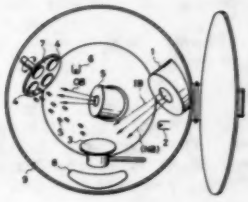
Shuichi Nogawa, and Eiji Kamijo, both of Kyoto, Japan, assignors to Nissin Electric Co., Ltd., Kyoto, Japan

Filed Mar. 25, 1988, Ser. No. 173,565

Claims priority, application Japan, Mar. 27, 1987, 62-75583

Int. Cl.[5] C23C *14/46;* **B05D** *5/12*

U.S. Cl. 505—1 **8 Claims**



1. A process for producing a superconducting thin film on a surface of a substrate, comprising the steps of:

sputtering a target made of a group IIIa metal and/or an oxide thereof, a group IIa metal and/or an oxide thereof and copper and/or an oxide thereof with an ion beam or a neutral beam to allow particles sputtered from the target to be deposited on the substrate, said group IIIa metal being selected from scandium, yttrium, and lanthanide elements and said group IIa metal being selected from magnesium, calcium, strontium, and barium; and impinging an oxygen neutral beam on the substrate, to thereby form a thin film of a IIa-IIa-Cu oxide.

4,920,095

SUPERCONDUCTING ENERGY STORAGE DEVICE

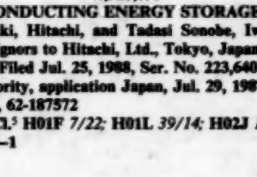
Yukio Ishigaki, Hitachi, and Tadasi Sonobe, Iwaki, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 25, 1988, Ser. No. 223,640

Claims priority, application Japan, Jul. 29, 1987, 62-187571; Jul. 29, 1987, 62-187572

Int. Cl.[5] H01F *7/22;* **H01L** *39/14;* **H02J** *15/00*

U.S. Cl. 505—1 **28 Claims**



1. A superconducting energy storage device for storing electric energy in the form of magnetic energy by passing an electric current through superconducting magnets for the purpose of releasing the magnetic energy in the form of elec-

tric energy as occasion demands, said superconducting magnets comprising a superconducting toroidal magnet and a superconducting solenoid magnet inside of said superconducting toroidal magnet, said magnets being connected electrically in series to each other.

4,920,096

METHOD FOR EXTRACTING CEDAR WOOD OIL

Paul Z. Bedoukian, 96 Warnecke Rd., Wilton, Conn. 06897

Filed Oct. 6, 1988, Ser. No. 255,356
Int. Cl.[5] C11B *9/00*; C07C *35/18*
U.S. Cl. 512—5 9 Claims

1. A method for extracting cedar wood oil from raw cedar wood comprising the steps of:

A. obtaining a batch of raw cedar wood;

B. covering the raw cedar wood with a water insoluble solvent having a boiling point lower than the cedar wood oil components and maintaining the raw cedar wood in this configuration for a predetermined time period;

C. removing the processed cedar wood from the resulting extract; and

D. removing the solvent from the extract to obtain the purified cedar wood oils.

4,920,097

IMMUNOSUPPRESSOR AND METHOD OF EXTRACTION THEREOF FROM LEUKOCYTES

A. Arthur Gottlieb; Robert C. Sizemore, and Sudhir K. Sinha, all of New Orleans, La., assignors to Imreg, Inc., New Orleans, La.

Continuation of Ser. No. 867,564, May 28, 1986, abandoned. This application Oct. 12, 1988, Ser. No. 256,581
Int. Cl.[5] A01N *37/18*; A61K *35/14*
U.S. Cl. 514—2 20 Claims

1. In a method of extracting a suppressor from an extract of leukocytes and purifying it whereby said suppressor is separated from extraneous materials in said extract, comprising the

(1) size fractionating said extract, thereby producing a first dialysate having a nominal M.W. cutoff of approximately 12,000;

(2) size fractionating said first dialysate, thereby producing a seond dialysate and a retentate, separated from one another at a nominal M.W. cutoff of approximately 3500;

(3) applying said retentate to a reverse phase octadecylsilane HPLC column;

(4) eluting said column with a solvent system;

the improvement comprising: eluting said column with an acetonitrile in dilute aqueous trifluoroacetic acid gradient, said gradient including a range of acetonitrile concentration from approximately 70% to approximately 80%, thereby producing elutants associated with different portions of said gradient; and collecting the elutant associated with the zone of said gradient wherein acetonitrile concentration is between approximately 75% and approximately 80%, whereby material designated herein as L-4 suppressor is provided.

5. A material having a M.W. between 3500 and 12,000, and further characterized by having the following properties:

(a) being substantially entirely chromotographically elutable from octadecylsilane by acetonitrile in dilute aqueous trifluoroacetic acid gradient, in the portions of said gradient between approximately 70% and approximately 85% acetonitrile concentration;

(b) being substantially not so elutable in the portions of said gradient below approximately 70% acetonitrile concentration; and

(c) being substantially free of material that is so elutable below said concentration and of material that is so elutable only above 90% acetonitrile concentration;

(d) not being chromotographically elutable from hydroxylapatite by aqueous ammonium bicarbonate gradient, in the portions of said gradient between approximately 0.1 M and 0.15 M; and

(e) nonspecifically causing a lessening of the magnitude or rate of an immune system reaction when administered to a human or other mammalian subject.

10. A method of decreasing the speed or magnitude of a person's immune system response comprising administration to said person of an effective dosage amount of material of claim 5.

4,920,098

NUTRITIONAL SUPPORT OR THERAPY FOR INDIVIDUALS AT RISK OR UNDER TREATMENT FOR ATHEROSCLEROTIC VASCULAR, CARDIOVASCULAR, AND/OR THROMBOTIC DISEASES

Richard Cotter, Libertyville; Robert C. Johnson, Westchester; Michael Ward, McHenry; David C. Madsen, Libertyville; Anthony J. Valicenti, Deerfield; Michael P. Menard, Grayslake, and Hugh N. Tucker, Barrington, all of Ill., assignors to Baxter International Inc., Deerfield, Ill.

Continuation of Ser. No. 908,447, Sep. 17, 1986, abandoned. This application Aug. 28, 1989, Ser. No. 403,849
Int. Cl.[5] A61K *37/02*, *31/195*, *31/715*
U.S. Cl. 514—2 14 Claims

1. A method for providing cardiac therapy to an individual in need of same through a parenteral regimen comprising:

a. a therapeutically effective amount of a protein source which includes a high biological value protein, amino acids including branched-chain amino acids and L-carnitine;

b. a therapeutically effective amount of a polysaccharide source supplemented with ribose and/or xylitol; and

c. a therapeutically effective amount of a lipid emulsion consistently essentially of a natural oil containing unsaturated fatty acids of 11 to 26 carbons in length, and an emulsifier.

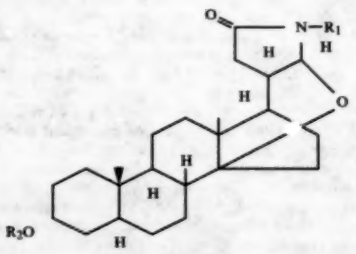
4,920,099

AMINOGLYCOSIDE STEROIDS, A PROCESS FOR THEIR PREPARATION, THEIR USE AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Laura Chiodini, Busto Arsizio; Mauro Gobbini, Sesto Calende; Sergio Mantegani, Milan; Daniela Ruggieri, Milan; Aldemio Temperilli, Milan; Gabriella Traquandi, Cornate d'Adda, and Patrizia Ferrari, Varese, all of Italy, assignors to Farmitalie Carlo Erba S.p.A., Milan, Italy

PCT No. PCT/EP87/00005, § 371 Date Oct. 29, 1987, § 102(e) Date Oct. 29, 1987, PCT Pub. No. WO87/04168, PCT Pub. Date Jul. 16, 1987
PCT Filed Jan. 7, 1987, Ser. No. 123,855
Claims priority, application United Kingdom, Jan. 9, 1986, 8600490
Int. Cl.[5] A61K *31/705*
U.S. Cl. 514—26 6 Claims

1. A compound and the pharmaceutically acceptable salts of said compound having the general formula I



I

wherein R_1 represents a hydrogen atom, an alkyl group having from 1 to 3 carbon atoms or an alkyl group substituted by an

amino, methylamino, dimethylamino, carbamoyl, carboxy or carboxy-C_1–C_4 alkyl group; and R_2 represents an aminodeoxy, aminodideoxy, or aminotrideoxy mono- or di-saccharide of the D or L series, or a C_1–C_4 alkyl substituted aminodeoxy, aminodideoxy or aminotrideoxy mono- or di-saccharide, of the D or L series.

4,920,100

ALKYL GYLCOSIDES AS POTENTIATING AGENTS IN ANTISEPTIC COMPOSITIONS

Rudolf Lehmann, Leichlingen; Klaus Hachmann, Hilden; Manfred Biermann, Muehlheim/Ruhr, and Harald Schnegelberger, Leichlingen, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany

Filed Jul. 9, 1987, Ser. No. 60,137

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1986, 3619375

The portion of the term of this patent subsequent to May 31, 2005, has been disclaimed.

Int. Cl.[5] A01N *61/00, 31/02;* **A61L** *2/16*

U.S. Cl. 514—23 **31 Claims**

1. A bactericidally active composition comprising:

A. a bactericidal quantity of at least one bactericidally active alcohol or carboxylic acid or its water-soluble salt; and

B. an activity potentiating quantity of at least one alkyl glycoside.

4,920,101

COMPOSITIONS COMPRISING 1-OXO- OR THIOHYDROCARBYL SUBSTITUTED AZACYCLOAKLKANES

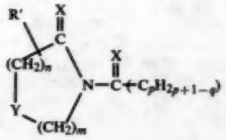
Gevork Minaskanian, Irvine, and James V. Peck, Costa Mesa, both of Calif., assignors to Nelson Research & Development Co., Irvine, Calif.

Filed Sep. 30, 1987, Ser. No. 103,445

Int. Cl.[5] A01N *31/19, 31/40, 43/36*

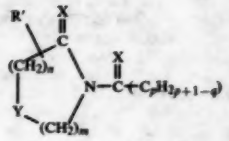
U.S. Cl. 514—24 **33 Claims**

1. A composition comprising an effective amount of a physiologically active agent and a non-toxic, effective penetrating amount of a compound represented by the general formula



wherein X may represent sulfur, oxygen or 2 hydrogen radicals; Y may represent —CH_2—, —NH— or oxygen; n and m are integers of from 1 to 3; p is an integer of from 3 to 17; wherein $p>9$; q is 2, 4, 6 or 8; and R′ is selected from the group consisting of H, a lower alkyl group having from 1 to 4 carbon atoms, phenyl, lower alkyl or halogen substituted phenyl, acetamido, halogen, piperidinyl, lower alkyl or halogen substituted piperidinyl, carbalkoxy, carboxamide, and alkanoyl.

18. A method for enhancing topical penetration of an effective amount& of a physiologically active agent through the skin or other membrane of a human or animal and retaining said active agent in the underlying body tissues, which method comprises contacting said physiologically active agent with said skin or other membrane in the presence of an effective topical penetrating amount of a compound of the general formula



wherein X may represent sulfur, oxygen or 2 hydrogen radicals; Y may represent —CH_2—, —NH— or oxygen; n and m are integers of from 1 to 3; p is an integer of from 3 to 17; q is 2, 4, 6 or 8; wherein $p \geq 9$; and R, is selected from the group consisting of H, a lower alkyl group having from 1 to 4 carbon atoms, phenyl, lower alkyl or halogen substituted phenyl, acetamido, halogen, piperidinyl, lower alkyl or halogen substituted piperidinyl, carbalkoxy, carboxamide, and alkanoyl.

4,920,102

METHOD FOR TREATING GASTROINTESTINAL DISORDERS

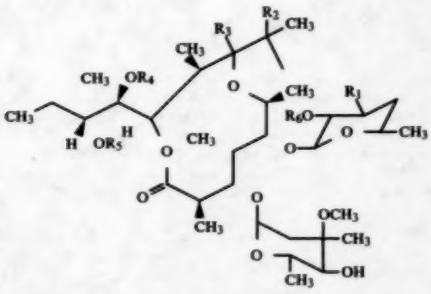
Jaswant S. Gidda, Carmel; Herbert A. Kirst, Indianapolis, and David W. Robertson, Greenwood, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 18, 1988, Ser. No. 182,645

Int. Cl.[5] A61K *31/70;* **C07H** *17/08*

U.S. Cl. 514—28 **24 Claims**

1. A method for treating gastrointestinal motility disorders in animals which comprises administering to the animal an amount of a compound of the formula



wherein

R_1 is $-N(CH_3)_2$ or $-[N(CH_3)_2R]^+X^-$;

R is C_1–C_6-alkyl, C_2–C_6-alkenyl, C_2–C_6-alkynyl, benzyl or benzyl substituted by form 1 to 3 substituents selected from fluoro, chloro, C_1–C_4-alkyl, C_1–C_4-alkyl, C_1–C_4-alkoxy, nitro, C_1C_4-alkoxycarbonyl, $-N(C_1$–C_4-alkyl$)_2$ or cyano;

each one of R_2 and R_3 is H, or together R_2 and R_3 form a second single bond to make a double bond;

R_4 and R_5 independently are H or C_1–C_4-acyl, or together with a carbonyl group form a five-numbered cyclic carbonate;

R^6 is H or C_1–C_4-acyl; and

X^- = halide, hydroxide, carboxylate, sulfate, phosphate, nitrate, C_1-C_4-alkylsulfonate or arylsulfonate;

or, when $R_1 = -N(CH_3)_2$, a pharmaceutically acceptable salt thereof; which is effective to enhance gastrointestinal motility.

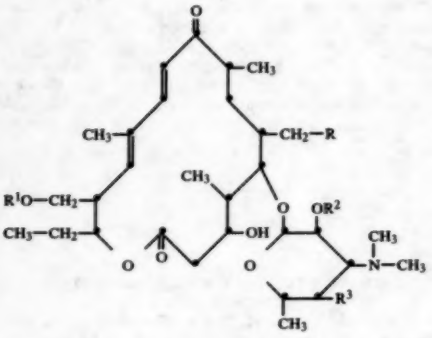
4,920,103

MODIFICATIONS OF MYCINOSE AND 3-O-DEMETHYLMYCINOSE IN TYLOSIN-TYPE MACROLIDES

Herbert A. Kirst, and James P. Leeds, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

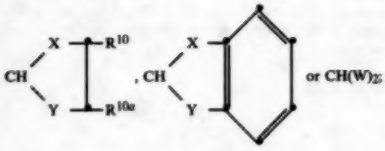
Filed Sep. 29, 1986, Ser. No. 912,891
Int. Cl.[5] A61K 31/70; C07H 17/08
U.S. Cl. 514—30 31 Claims

1. A compound of the formula:

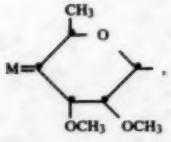


1

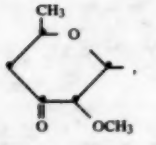
wherein
R is CH_2Z,



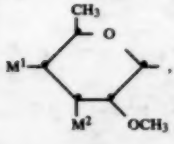
Z is hydrogen, halo, OR^4, SR^5, N_3 or NR^6R^7;
X and Y independently represent O, S, N-CH_3, N-phenyl or N-benzyl;
W is O(C_1–C_4-alkyl), S-phenyl or S-(R^{11}-substituted-phenyl);
R^1 is



(a)



(b)



(c)

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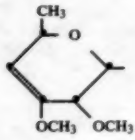


(d)

wherein
M is O, NOR^{1a} or NH;
M^1 is halo, N_3, $NR^{12}R^{13}$, NH(C_1–C_4-alkanoyl), pyridinium, pyrrolyl, C_1–C_4-alkoxy, (C_{1}–$_{C3}$-alkoxy)-(C_{1}–$_{C3}$-alkoxy), OSO_2R^{1b} or imidazolyl-thiocarbonyloxy;
M^2 is hydroxy or methoxy;
R^{1a} is hydrogen, C_1–C_4-alkyl or C_1–C_4-alkyl having a C_1–C_3-alkoxy, (C_1–C_3-alkoxy)-(C_1–C_3-alkoxy), NR^8R^9 or (R^8R^9N)-(C_1–C_3-alkoxy) substituent;
R^{1b} is C_1–C_4-alkyl, halo-substituted-C_1–C_4-alkyl, phenyl, benzyl, or phenyl or benzyl having from one to three C_1–C_3-alkyl, C_1–C_3-alkoxy or halo substituents;
R^2 is hydrogen, C_1–C_5-alkanoyl, halo-substituted-C_1–C_5-alkanoyl, or benzoyl, phenylacetyl or phenylpropionyl, each of which may have an R^{11} substituent on the phenyl ring;
R^3 is hydrogen, OR^2 or mycarosyloxy;
R^4 is C_1–C_4-alkyl; C_1–C_4-alkanoyl; cyclohexyl; phenyl, benzyl, phenethyl or phenoxyethyl each of which may have an R11 substituent on the ring; or a heteroaryl group selected from pyridinyl, pyrimidinyl, pyridazinyl or pyrazinyl;
R^5 is C_1–C_4-alkyl; cyclohexyl; phenyl, benzyl or phenethyl, each of which may have an R^{11} substituent on the phenyl ring; or a heteroaryl group selected from pyridinyl, tetrazolyl, oxazolyl or thiazolyl;
R^6 and R^7 independently are hydrogen, C_1–C_8-alkyl or a group of the formula:

$(CH_2)_n(Cyc)$

where n is 0, 1 or 2, and Cyc is C_3–C_8-cycloalkyl, phenyl or R^{11}-substituted phenyl; or taken together with the adjacent nitrogen atom form a saturated or unsaturated heterocyclic monocyclic ring containing from 5 to 16 ring atoms or a bicyclic or tricyclic ring system containing from 8 to 20 ring atoms wherein one or more of the ring atoms may be substituted by C_1–C4-alkyl, C_1–C4-alkoxy, C_1–C4-alkoxycarbonyl, hydroxy, C_1–C4-alkanoyloxy, halo, NR^8R^9, phenyl or R^{11}-substituted phenyl;
R^8 and R^9 independently are C_1–C_4-alkyl or $(CH_2)_n(Cyc)$; or taken together with the adjacent nitrogen atom form a saturated heterocyclic monocyclic ring containing from 5 to 8 ring atoms;
R^{10} and R^{10a} independently are hydrogen, methyl, phenyl, methoxycarbonyl, ethoxycarbonyl or phenoxycarbonyl; and
R^{11} is halo, C_1–C_3-alkyl, C_1–C_3-alkoxy, nitro or hydroxy; and
R^{12} and R^{13} independently are hydrogen, cyanomethyl, C_1–C_4-alkyl or $(CH_2)_n(Cyc)$; or taken together with the adjacent nitrogen atom form a saturated heterocyclic monocyclic ring containing from 5 to 8 ring atoms;
and the acid addition salts of these compounds.

29. A composition useful for treating susceptible bacterial infections and infections caused by susceptible Mycoplasma species comprising an effective amount of a compound of claim 1 and a suitable pharmaceutical vehicle.

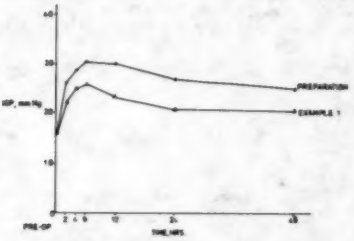
30. A method for treating infections caused by susceptible bacteria which comprises administering an effective amount of a composition of claim 29 to an animal.

4,920,104

SODIUM HYALURONATE COMPOSITION

Dale P. DeVore, Chelmsford; David A. Swann, Lexington, and Bernard P. Sullivan, Andover, all of Mass., assignors to Med-Chem Products, Inc., Acton, Mass.

Filed May 16, 1988, Ser. No. 194,187
Int. Cl.[5] A61K *31/715, 31/73*
U.S. Cl. 514—54 **4 Claims**



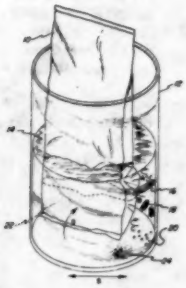
3. In a method of protecting mammalian eye tissue and structures during ophthalmological surgery by introducing into the anterior segment of the eye, a viscoelastic solution of sodium hyaluronate, the improvement which comprises; using as the solution one having a kinematic viscosity of from 45,000 to 64,000 cSt. and wherein the weight average molecular weight of the sodium hyaluronate is within the range of from 1 to 2 million Daltons.

4,920,105

MEMBRANE POUCH

Allen Zelman, Vienna, Va., assignor to Rensselaer Polytechnic Insitute, Troy, N.Y.

Filed Jul. 9, 1987, Ser. No. 71,666
Int. Cl.[5] A61J *1/00*
U.S. Cl. 514—59 **24 Claims**



1. A membrane pouch for producing a sterile solution from non-sterilized fresh water, the pouch comprising:

a first closed bag of semipermeable membrane material, said membrane material being permeable to water molecules and impermeable to viruses, bacteria and pyrogens;

a second, waterproof bag substantially enclosing said first bag;

first sealable port means for providing access to a first compartment within said first bag;

second sealable port means for providing access to a second compartment, said second compartment lying between said first bag and said second bag; and

a sterile solute to be hydrated located in one of said first and second compartments, said solute comprising a large molecular weight osmotic agent which is impermeant to said membrane material and an osmotic accelerator, said osmotic accelerator comprising a non-toxic, water soluble, low molecular weight substance which is permeant to said membrane member and possesses a high osmotic pressure, said accelerator serving to initiate and accelerate hydrating of the osmotic agent, whereby fresh water placed in the other of said compartments is transferred by accelerated osmosis to said one of said compartments containing said solute while the membrane material precludes passage of bacteria, viruses and pyrogens therethrough.

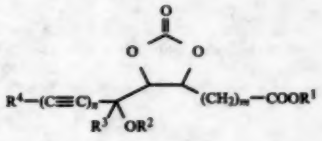
4,920,106

ACETYLENIC CYCLIC CARBONATES

Michael N. Chang, Westfield; Yuan-Ching P. Chiang, Piscataway; James V. Heck, Scotch Plains; Michael D. Lewis, Rahway, and Shu S. Yang, Bridgewater, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 156,111, Feb. 16, 1988, abandoned.
This application Aug. 1, 1989, Ser. No. 388,716
Int. Cl.[5] A61K *31/695;* C07D *317/20*
U.S. Cl. 514—63 **23 Claims**

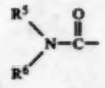
1. A compound of the formula:



wherein

R^1 is:
- (a) hydrogen;
- (b) C_1–C_6 alkyl;
- (c) C_7–C_{14} aralkyl;
- (d) tris(C_1–C_6 alkyl)silyl; or
- (e) a pharmaceutically acceptable cation;

R^2 is
- (a) hydrogen;
- (b) C_1–C_6 alkyl;
- (c) C_7–C_{14} aralkyl;
- (d) tris(C_1–C_6 alkyl)silyl;
- (e) C_2–C_6 alkanoyl;
- (f) C_2–C_7 alkoxycarbonyl; or
- (g)



wherein R^5 and R^6 are independently:
- (i) hydrogen;
- (ii) C_1–C_6 alkyl; or
- (iii) phenyl;

R^3 is:
- (a) hydrogen; or
- (b) C_1–C_6 alkyl;

R^4 is:
- (a) C_1–C_6 alkyl;
- (b) C_7–C_{14} aralkyl; or
- (c) tris(C_1–C_6 alkyl)silyl;

m is an integer of from about 2 to 8; and

n is an integer of from about 1 to 4.

22. A pharmaceutical composition useful in the treatment of fungal diseases or hypercholesterolemic conditions comprising a therapeutically effective amount of at least one compound according to claim 1, together with one or more non-toxic pharmaceutically acceptable carriers.

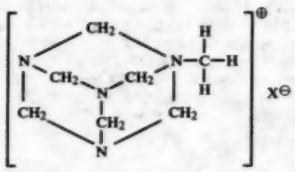
4,920,107

1-METHYL-3,5,7-TRIAZA-1-AZONIATRICYCLODECANE COMPOUNDS, A METHOD FOR PREPARING THESE COMPOUNDS, AND THEIR USE IN THE CONTROL OF MICROORGANISMS IN AQUEOUS SYSTEMS

John D. Pera, Cordova, and S. Rao Rayudu, Germantown, both of Tenn., assignors to Buckman Laboratories International, Inc., Memphis, Tenn.

Filed Mar. 29, 1988, Ser. No. 174,812
Int. Cl.[5] C07D 487/18; A01N 43/90; C10M 105/58; C09D 5/14
U.S. Cl. 514—244 25 Claims

1. A method of preserving an aqueous system which is susceptible to microbiological degradation, comprising the step of adding to said system a compound having the formula



wherein X is an anion selected from the group consisting of sulfate, acetate and citrate groups, and wherein said compound is added in an amount sufficient to inhibit the growth and proliferation of at least one microorganism in said aqueous system.

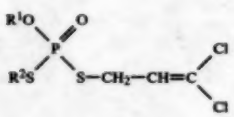
4,920,108

BISTHIOLPHOSPHATES AS PESTICIDES

Rainer Bürstinghaus, Heidelberg, and Peter Hofmeister, Neustadt, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 27, 1988, Ser. No. 149,111
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1987, 3704123
Int. Cl.[5] A01N 57/10; C07F 9/173
U.S. Cl. 514—134 7 Claims

1. Bisthiolphosphates of the formula I



(I)

where R^1 is ethyl or isopropyl and R^2 is branched or straight-chain C_1–C_4-alkyl.

3. A process for combating pests, wherein the pests and/or the areas and/or spaces to be kept free from pests are treated with a pesticidally effective amount of a bisthiolphosphate of the formula I as set forth in claim 1.

4,920,109

ANTIFUNGAL COMPOSITIONS AND METHOD OF CONTROLLING MYCOTIC INFECTIONS

Janet C. Onishi, Mountainside, and Arthur A. Patchett, Westfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 18, 1988, Ser. No. 182,615
The portion of the term of this patent subsequent to May 1, 2007, has been disclaimed.
Int. Cl.[5] A61K 31/58, 31/335, 31/35
U.S. Cl. 514—171 20 Claims

1. A method for potentiating the antifungal properties of an antifunga agent comprising coadministering a 25-azasterol compound with a non-steroidal antifungal agent.

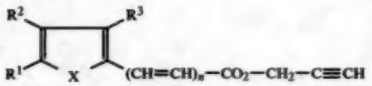
4,920,110

PROPARGYL FURAN- AND THIOPHENECARBOXYLATES

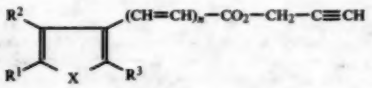
Hans-Jürgen Neubauer, Mannheim; Wolfgang Seppelt, Bobenheim-Boxheim; Rainer Bürstinghaus, Heidelberg; Peter Hofmeister, Neustadt, and Christoph Kuenasi, Waldsee, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 90,446, Aug. 28, 1987, abandoned. This application Apr. 14, 1989, Ser. No. 338,562
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1986, 3629584; Nov. 29, 1986, 3640878
Int. Cl.[5] A01N 43/02, 43/08; C07D 333/38, 333/32
U.S. Cl. 514—438 6 Claims

1. Propargyl furan- and thiophenecarboxylates of the formulae Ia and Ib



(Ia)



(Ib)

where R^1, R^2 and R^3 are each hydrogen, chlorine, bromine, C_1–C_4-alkyl, C_2–C_4-alkenyl, C_1–C_4-haloalkyl, C_2–C_4-haloalkenyl, or phenyl which is unsubstituted or substituted by halogen, C_1–C_4-alkyl, or C_1–C_4-alkoxy, X is oxygen or sulfur, n is the integer 1, and, if X is sulfur, R^1, R^2 and R^3 may furthermore be fluorine, cyano, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy, C_2–C_4-alkenyloxy or C_2–C_4-haloalkenyloxy.

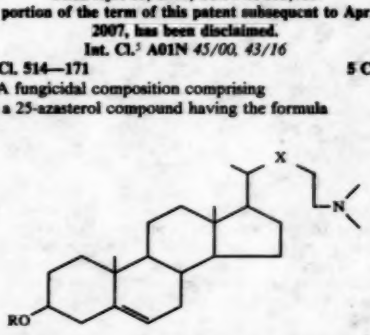
4,920,111

FUNGICIDAL COMPOSITIONS AND METHODS UTILIZING 25-AZASTEROL AND HMG-COA REDUCTASE INHIBITORS

Janet C. Onishi, Mountainside, and Arthur A. Patchett, Westfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 18, 1988, Ser. No. 182,605
The portion of the term of this patent subsequent to Apr. 24, 2007, has been disclaimed.
Int. Cl.[5] A01N 45/00, 43/16
U.S. Cl. 514—171 5 Claims

1. A fungicidal composition comprising
(1) a 25-azasterol compound having the formula



wherein R is hydrogen or lower acyl, X is CH, CH_2 or O; and the on the side chain indicates that the bond may be a single or a double bond provided that when X is O, or CH_2, it is a single bond; and
(2) a HMG-CoA reductase inhibitor compound in admixture with a pharmaceutically acceptable carrier.

4,920,112

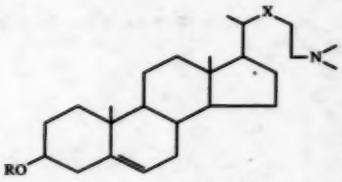
FUNGICIDAL COMPOSITIONS AND METHOD

Janet C. Onishi, Mountainside, and Arthur A. Patchett, Westfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 18, 1988, Ser. No. 182,536
Int. Cl.[5] A61K *31/56, 31/135*
U.S. Cl. 514—171 5 Claims

1. A fungicidal composition comprising

(1) a 25-azasterol compound having the formula



wherein R is hydrogen or lower acyl, X is CH, CH_2 or O; the on the side chain indicates that the bond may be a single or a double bond provided that when X is O, or CH_2, it is a single bond; and

(2) a squalene epoxidase inhibitor compound in admixture with a pharmaceutically acceptable carrier.

4,920,113

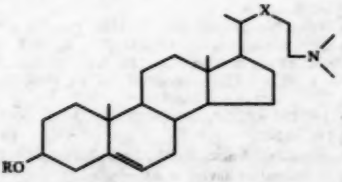
FUNGICIDAL COMPOSITIONS AND METHODS UTILIZING 25-AZASTEROL AND HMG-COA SYNTHASE INHIBITORS

Janet C. Onishi, Mountainside, and Arthur A. Patchett, Westfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 18, 1988, Ser. No. 182,616
Int. Cl.[5] A01N *45/00, 43/02*
U.S. Cl. 514—171 5 Claims

1. A fungicidal composition comprising

(1) a 25-azasterol compound having the formula



wherein R is hydrogen or lower acyl, X is CH, CH_2 or O; the on the side chain indicates that the bond may be a single or a double bond provided that when X is O, or CH_2, it is a single bond; and

(2) a HMG-CoA synthase inhibitor compound in admixture with a pharmaceutically acceptable carrier.

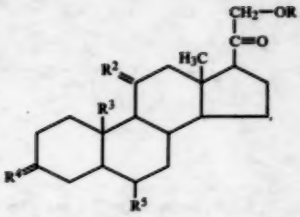
4,920,114

19-FLUORO- OR CYANO-21-HYDROXYPROGESTERONE DERIVATIVES USEFUL AS 19-HYDROXYLASE INHIBITORS

Gene W. Holbert, Loveland, and J. O'Neal Johnston, Milford, both of Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Jun. 28, 1988, Ser. No. 212,410
Int. Cl.[5] C07J *1/00*; A61K *31/56*
U.S. Cl. 514—177 4 Claims

1. A compound of the formula



wherein R is hydrogen or

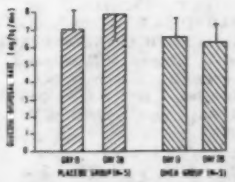
R^2 is (H)(H), (H)(OH) or O; R^3 is difluoromethyl, cyanomethyl, or cyano; R^4 is =O, (H)(OH), (H)(OR^5), or $=CH_2$; R^5 is hydrogen, amino, hydroxy, oxo or methylene; R^6 is C_{1-6} alkyl, C_{5-7} cycloalkyl or phenyl; R^8 is C_{2-10} alkanoyl; and each of the dotted lines indicate the optional presence of a double bond with the proviso that a 5,6-(double bond) is present only when R_4 is (H)(OH) or when there is no double bond at the 4,5-position or 6,7-position and with the proviso that a 9,11-double bond can be present only when R^2 is (H)(H).

4,920,115

METHOD OF LOWERING LDL CHOLESTEROL IN BLOOD

John E. Nestler, Richmond, Va.; Cornelius O. Bartascini, Columbus, Ga.; John N. Clore, and William G. Blackard, both of Richmond, Va., assignors to Virginia Commonwealth University, Richmond, Va.

Filed Dec. 28, 1988, Ser. No. 291,149
Int. Cl.[5] A61K *31/56*
U.S. Cl. 514—178 8 Claims



1. A method of lowering low density lipoprotein cholesterol concentrations in human beings, comprising a step of administering a therapeutic dose of dehydroepiandrosterone to a patient to lower said low density lipoprotein cholesterol concentration in said patient.

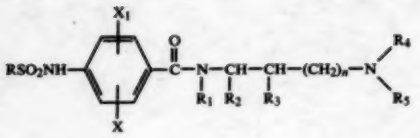
4,920,116

N-(AMINOALKYL)-SUBSTITUTED(N OR C ALKYL)-ARYL-4(METHYLSULFONYLAMINO)BENZAMIDES

Thomas K. Morgan, Jr., Morris Plains, N.J., and Klaus Nickisch, West Berlin, Fed. Rep. of Germany, assignors to Schering A.G., Berlin, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 914,216, Oct. 2, 1986, abandoned. This application Dec. 13, 1988, Ser. No. 283,712
Int. Cl.[5] C07C *143/74*
U.S. Cl. 514—210 24 Claims

1. A member selected from the group consisting of a compound of the formula:



wherein

R is a C_1–C_4 straight chain alkyl;

two of R_1, R_2 and R_3 are hydrogen and the other is phenyl, substituted phenyl, naphthalenyl and substituted naphthalenyl;

R_4 and R_5 are hydrogen, C_1–C_8 straight or branched chain alkyl, allyl, cycloalkyl, cycloalkyl(lower)-alkyl, phenyl(lower)alkyl, substituted phenyl(lower)alkyl or together with the amino nitrogen atom form a saturated heterocyclic ring of from 4 to 8 ring members or a corresponding ring which contains a —O— or

linkage;

R_6 is hydrogen, C_1–C_8 straight or branched chain alkyl, phenyl or substituted phenyl,

X,X_1 are the same or independently hydrogen and C_1–C_4 straight or branched chain alkyl; and

n is the integer 0 or 1; the word substituted in each occurrence means bearing 1 to 3 substituents selected from the group consisting of C_1–C_4-alkyl, C_1–C_4-alkoxy, trifluoromethyl, fluorine, chlorine and bromine, and the pharmaceutically acceptable salts thereof; with the proviso that only one of R_4 and R_5 can be hydrogen.

4,920,117

4,5,5A,6-TETRAHYDRO-3H-ISOXAZOLO(5,4,3-KL)ACRIDINES, PHARMACEUTICAL COMPOSITIONS AND USE

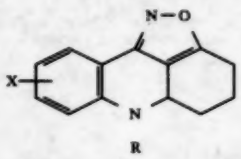
Gregory M. Shutske, Somerset, N.J., assignor to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed Jun. 9, 1989, Ser. No. 364,420

Int. Cl.[5] A61K *31/435, 31/535;* **C07D** *498/04*

U.S. Cl. 514—212 **16 Claims**

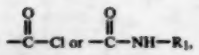
1. A compound of the formula



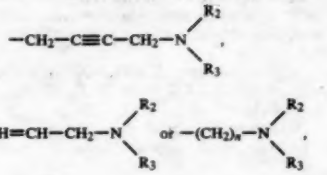
where

X is hydrogen, loweralkyl, loweralkoxy, halogen or trifluoromethyl, and

R when present is hydrogen, loweralkyl, allyl, arylloweralkyl,

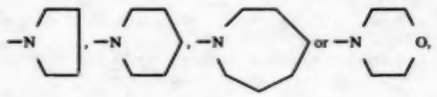


wherein R_1 is loweralkyl, $—CH_2C{\equiv}CH$,



n being 2, 3 or 4 and R_2 and R_3 being independently loweralkyl, or the group

taken as a whole constituting



or a pharmaceutically acceptable acid addition salt thereof.

14. A pharmaceutical composition comprising a compound as defined in claim 1 in an amount effective for alleviating pain or a memory dysfunction characterized by a decreased cholinergic function and a suitable carrier therefor.

4,920,118

AROMATIC 2-AMINOALKYL-1,2-BENZOISOTHIAZOL-3-(2H)ONE-1,1-DIOXIDE AND THEIR USE AS ANXIOLYTIC AND ANTI-HYPERTENSIVE AGENTS

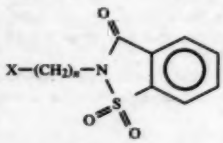
Marcel Hilbert, Strasbourg, and Maurice W. Gittos, Plobsheim, both of France, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Division of Ser. No. 244,894, Sep. 12, 1988, Pat. No. 4,857,526, which is a division of Ser. No. 158,432, Feb. 22, 1988, Pat. No. 4,789,676, which is a division of Ser. No. 836,276, Mar. 5, 1986, Pat. No. 4,748,182. This application Jun. 15, 1989, Ser. No. 366,824

Int. Cl.[5] A61K *31/38;* **C07D** *279/12, 295/00*

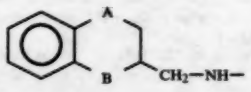
U.S. Cl. 514—224.2 **13 Claims**

1. An aromatic 2-aminoalkyl-1,2-benzoisothiozol-3(2H)one-1,1-dioxide derivative having the formula



wherein n is an integer of from 2 to 5;

X is



wherein one of A and B is a sulfur and the other is =NR'

wherein R' is hydrogen or methyl; or a pharmaceutically acceptable acid addition salt thereof.

10. A method for relieving the symptoms of anxiety in a patient in need thereof, which comprises the administration to said patient of an anxiolytic effective amount of a compound of one of claims 1–9.

4,920,119

TRIAZINE DERIVATIVES

Michael R. Attwood, Hitchin; Peter H. Crackett, Baldock, and Geoffrey Lawton, Hitchin, all of England, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

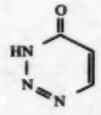
Filed Nov. 24, 1987, Ser. No. 124,750

Claims priority, application United Kingdom, Dec. 12, 1986, 8629711; Sep. 14, 1987, 8721564

Int. Cl.[5] C07D *471/04, 487/04, 513/04;* A61K *31/53*

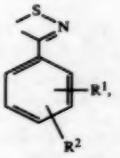
U.S. Cl. 514—243 17 Claims

17. A method of treating ischemia or gout in an afflicted mammal comprising administering to the mammal a compound of the formula

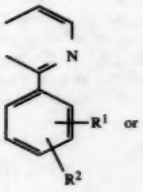


I

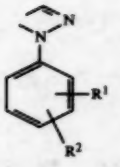
wherein A is a grouping of the formula



(a)



(b)



(c)

in which R^1 and R^2 each individually is hydrogen, halogen, trifluoromethyl, nitro amino, cyano, C_1-C_6-alkyl, C_1-C_6-alkoxy, C_3-C_6-alkenyloxy, C_1-C_6-alkylthio, C_1-C_6-alkanoylamino, aryloxy, aryl-(C_1-C_6-alkyl), aryl-(C_1-C_6-alkoxy), aryl-(C_1-C_6-alkoxy)carbonylamino or —O—CH$_2$—R^3, or R^1 and R^2 on adjacent carbon atoms together are —CH=CH—CH=CH' or —CH_2—CH_2—O—, and R^3 is hydroxy-(C_1-C_4-alkyl) or vicinal dihydroxy-(C_2-C_5-alkyl), and pharmaceutically acceptable acid addition salts of those compounds of formula I in which at least one of R^1 and R^2 is amino, or tautomers thereof, in an amount which is effective in treating ischemia or gout.

4,920,120

ANTIBACTERIAL AGENTS

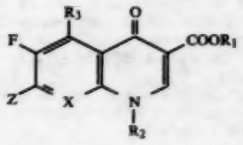
John M. Domagala; Susan E. Hagen, both of Canton, and John S. Kiely, Ann Arbor, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 147,462, Jan. 25, 1988. This application Dec. 9, 1988, Ser. No. 280,924

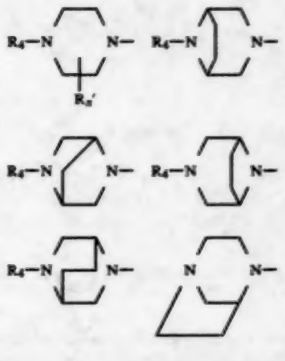
Int. Cl.[5] A61K *31/495;* C07D *401/04*

U.S. Cl. 514—254 9 Claims

1. A compound of formula



or a pharmaceutically acceptable acid addition or base salt thereof wherein Z is



wherein

R_4 is hydrogen, alkyl of from one to four carbon atom, a cycloalkyl of from three to six carbon atoms, R' is hydrogen, hydroxyl, alkyl of from one to four carbon atoms, phenyl or phenyl substituted by halogen, alkyl or alkoxy, n is an integer of from 0 to 4, R_5 and R_6 are each independently hydrogen, lower alkyl or cycloalkyl;

X is N,;

R_3 is lower straight, branched, or cyclic alkyl of from one to three carbon atoms;

R_2 is alkyl of from one to four carbon atoms, vinyl, haloalkyl, hydroxyalkyl of from two to four carbon atoms, cycloalkyl of from three to six carbon atoms, phenyl or phenyl substituted by halogen, alkyl, NH_2 or OH; and

R_1 is hydrogen, alkyl of from one to six carbon atoms, or a cation.

8. A pharmaceutical composition comprising an antibacterially effective amount of compound according to claim 1 together with a pharmaceutically acceptable carrier.

4,920,121

ANXIOLYTIC ACTIVITY OF N-(2-METHOXYPHENYL)PIPERAZINE

John A. Moyer, New Hope, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Sep. 22, 1989, Ser. No. 411,066

Int. Cl.[5] A61K *31/495*

U.S. Cl. 514—255 3 Claims

1. A method for symptomatic relief of anxiety disorders which comprises administering, orally or parenterally, to a

patient suffering from anxiety, an antianxiety amount of N-(2-methoxyphenyl)piperazine or a pharmaceutically acceptable salt thereof.

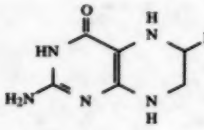
4,920,122

PHARMACEUTICAL COMPOSITION AND METHOD FOR THE TREATMENT OF INFANTILE AUTISM

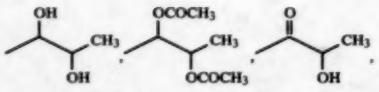
Hiroshi Naruse, Tokyo; Masashi Takesada, Hyogo; Osamu Hayaishi, and Yasuyoshi Watanabe, both of Kyoto, all of Japan, assignors to Suntory Limited, Osaka, Japan

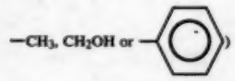
Division of Ser. No. 870,495, Jun. 4, 1986, Pat. No. 4,778,794.
This application Jun. 23, 1988, Ser. No. 210,312
Claims priority, application Japan, Jun. 4, 1985, 60-121347
Int. Cl.[5] A61K *31/50, 31/495*
U.S. Cl. 514—254 **8 Claims**

1. A method for ameliorating infantile autism in a child comprising administering to said child an effective amount of a compound of the formula:



(wherein R is





or a salt thereof as a major effective ingredient and at least one auxiliary effective ingredient selected from 5-hydroxytryptophan and L-DOPA, at a ratio of the major and auxiliary effective ingredients of 1:0.1 - 10 by weight.

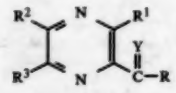
4,920,123

METHOD FOR CONTROLLING AND/OR LOWERING SERUM TRIGLYCERIDE AND/OR CHOLESTEROL LEVELS IN MAMMALS

Karl H. Beyer, Jr., 1001 Gypsy Hill Rd., Penllyn, Pa. 19422

Filed Oct. 21, 1988, Ser. No. 260,947
Int. Cl.[5] A61K *31/495*
U.S. Cl. 514—255 **6 Claims**

1. A method for controlling or lowering a patient's serum cholesterol concentration, comprising administering to a patient an effective amount of a compound of the formula (I)



wherein

Y is O or NH,

R is OH, $NHCONR^4R^5$; or $N{=}C(NR^4R^5)_2$; where R^4 and R^5 are each independently selected from the group consisting of hydrogen; $C_{1\text{-}10}$ alkyl, straight or branched chain; aryl $C_{1\text{-}4}$ alkyl; mono- or di-substituted aryl $C_{1\text{-}4}$ alkyl where the substituents are fluoro, chloro, bromo, iodo, or $C_{1\text{-}10}$ alkyl, straight or branched chain;

R^1 and R^2 are each independent selected from the group consisting of hydrogen, amino, and mono- or di-substituted amino where the substituents are $C_{1\text{-}10}$ alkyl, straight or branched chain, or $C_{3\text{-}8}$ cycloalkyl; provided that R^1 and R^2 may not both be amino or substituted amino; and

R^3 is hydrogen, trifluoromethyl; fluoro; chloro; bromo; or iodo; or a pharmaceutically acceptable salt thereof.

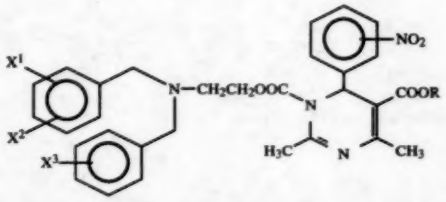
4,920,124

N-SUBSTITUTED 3,4-DIHYDROPYRIMIDINE COMPOUNDS AS AGENTS FOR TREATING DISORDERS OF CARDIOVASCULAR SYSTEM

Hidetsura Cho, Osaka, and Masaru Ueda, Saitama, both of Japan, assignors to Suntory Limited, Osaka, Japan

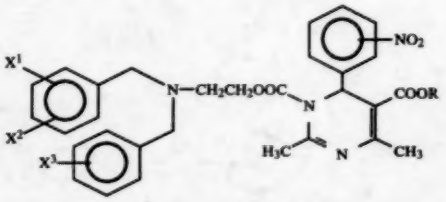
Filed Feb. 19, 1988, Ser. No. 157,777
Claims priority, application Japan, Feb. 21, 1987, 62-38345
Int. Cl.[5] A61K *31/505;* **C07D** *239/02*
U.S. Cl. 514—256 **5 Claims**

1. A N substituted 3,4-dihydropyrimidine compound of the formula:



wherein R is a straight or branched cyclic or cyclo straight alkyl having from one to three carbon atoms, and X^1, X^2 and X^3 are the same or different and are hydrogen, halogen, lower alkyl having from one to four carbon atoms, lower alkoxy having from one to four carbon atoms, nitro, trifluoromethyl, hydroxy, or t-butyldimethylsilyloxy with the proviso that the case where X^1, X^2 and X^3 are all hydrogen is not applicable.

5. A composition for treating disorders of the cardiovascular system selected from the group consisting of hypertension, cerebral circulation disorders and angina, comprising a N-substituted 3,4-dihydropyrimidine compound of the formula:



wherein X^1, X^2, X^3 and R as defined in claim **1**, in an amount effective for treating said disorders of the cardiovascular system, and a pharmaceutically acceptable carrier.

4,920,125

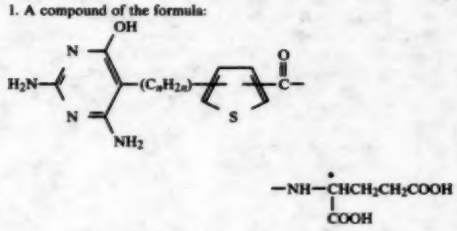
L-GLUTAMIC ACID DERIVATIVES

Edward C. Taylor, Princeton, N.J.; Philip M. Harrington, Plainwell, Mich., and Chuan Shih, Indianapolis, Ind., assignors to The Trustees of Princeton University, Princeton, N.J.

Filed Aug. 29, 1989, Ser. No. 399,993
Int. Cl.[5] C07D *239/48, 239/49;* **A61K** *31/505*
U.S. Cl. 514—272 **7 Claims**

1. A compound of the formula:

1. A compound of the formula:



in which n has a value of 2 to 6; and the configuration about the carbon atom designated • is L; and the pharmaceutically acceptable salts thereof.

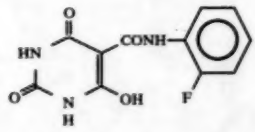
4,920,126

BARBITURIC ACID DERIVATIVE AND TREATMENT OF LEUKEMIA AND TUMORS THEREWITH

Arthur D. Brewer, Puslinch, Canada, assignor to Uniroyal Chemical Ltd/Uniroyal Chemical Ltee, Don Mills, Canada

Filed May 10, 1988, Ser. No. 192,459
Int. Cl.[5] A61K *31/505*; C07D *239/60*
U.S. Cl. 514—274 **3 Claims**

1. A compound of the formula:



or the pharmacologically acceptable addition salts thereof.

3. A method for inducing regression or inhibiting the growth of lymphoid leukemia in mammals which comprises administering a therapeutically effective amount of the compound of claim 1 to mammals.

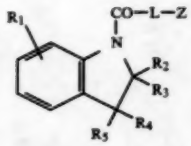
4,920,127

SUBSTITUTED INDOLES AND THEIR USE AS 5-HT$_3$ RECEPTOR ANTAGONISTS

Francis D. King, and Karen A. Joiner, both of Harlow, England, assignors to Beecham Group p.l.c., England

Filed Feb. 16, 1988, Ser. No. 155,756
Claims priority, application United Kingdom, Feb. 18, 1987, 8703815; May 28, 1987, 8712492; Aug. 8, 1987, 8718844
Int. Cl.[5] A61K *31/395*; C07D *213/00, 221/02, 453/02*
U.S. Cl. 514—278 **9 Claims**

1. A compound of the formula (I), or a pharmaceutically acceptable salt thereof:



(I)

wherein

L is NH or O;

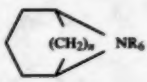
R_1 is hydrogen, fluoro or choloro;

R_2 and R_5 are independently hydrogen or C_{1-6} alkyl or together are a bond; or one or both of R_2 and R_3, and R_4 and R_5, together are C_{2-7} polymethylene or $-(CH_2)_m-O-(CH_2)_x-$ where m and x are 1 to 5 such that m+x is 2 to 6;

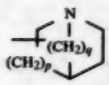
R_3 is hydrogen;

R_4 is C_{1-7} alkanoyl, C_{1-6} is alkoxycarbonyl, hydroxycarbonyl, aminocarbonyl optionally substituted by one or two C_{1-6} alkyl groups, CF_3, C_{1-6} alkyl substituted by C_{1-6} alkoxy, C_{1-6} alkylthio or by C_{1-6} alkoxycarbonyl, or R_4 is phenyl or phenyl-C_{1-4} alkyl optionally substituted in the phenyl ring by one or two of halogen, C_{1-6} alkyl or C_{1-6} alkoxy;

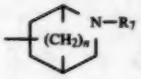
Z is a group of formula (a), (b), or (c)



(a)



(b)



(c)

wherein

n is 2 or 3;

p is 1 or 2;

q is 1 to 3;

r is 1 to 3; and

R_6 or R_7 is C_{1-4} alkyl.

7. A compound selected from the group consisting of (endo)-N-(8-methyl-8-azabicyclo(3,2,1)oct-3-yl)-N-(spiro(cyclohexyl-3-indolin-1-yl))urea,

(endo)-N-(8-methyl-8-azabicyclo(3.2.1)oct-3-yl)2,3-dihydro-3-ethoxycarbonylindol-1-yl-urea,

(endo)-N-(8-methyl-8-azabicyclo(3.2.1)oct-3-yl)2,3-dihydro-3-ethoxycarbonyl-3-methylindol-1-yl urea,

(endo)-N-(8-methyl-8-azabicyclo(3.2.1)oct-3-yl)2,3-dihydro-3-hydroxycarbonyl-3-methylindol-1-yl urea,

(endo)-N-(8-methyl-8-azabicyclo(3.2.1)oct-3-yl)2,3-dihydro-3-N,N-dimethylaminocarbonyl-3-methylindol-1-yl urea,

(endo)-N-(8-methyl-8-azabicyclo(3.2.1)oct-3-yl)-N'-[spiro(cyclopropyl-3-indolin-1-yl)]urea,

(endo)-N-(8-methyl-8-azabicyclo(3.2.1)oct-3-yl)2,3-dihydro-3-phenylindol-1-yl urea,

N-(1-azabicyclo(2.2.2)oct-3-yl)2,3-dihydro-3-phenylindol-1-yl urea,

(endo)-N-(8-methyl-8-azabicyclo(3,2,1)oct-3-yl)-3-phenylindol-1-yl urea,

(endo)-N-(8-methyl-8-azabicyclo(3.2.1)oct-3-yl)-N'-(spiro(cyclopentyl-3-indolin-1-yl))urea,

and pharmaceutically acceptable salts of any of the foregoing.

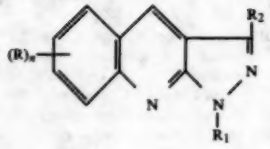
4,920,128

PYRAZOLO[3,4-B]QUINOLINES AND THEIR USE AS ANTIVIRAL AGENTS

Malcolm R. Bell, East Greenbush, and James H. Ackerman, Albany, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 71,110, Jul. 8, 1987, abandoned. This application May 20, 1988, Ser. No. 196,598
Int. Cl.[5] A61K *31/415, 31/435*; C07D *413/00, 471/00*
U.S. Cl. 514—293 **12 Claims**

1. A compound of the formula



wherein:

R is hydrogen or one or two substituents selected from hydroxy and lower-alkoxy wherein n is 1 or 2;

R_1 is a member of the group consisting of hydrogen, lower-alkyl, phenyl, and —Y—R_3, whereIn Y is lower-alkylene of 1–4 carbon atoms and R_3 is selected from the group consisting of lower-alkylamino, di(lower-alkyl)amino, 1-pyrrolidinyl, 1-piperidinyl, 4-morpholinyl, lower-alkoxycarbonyl, lower-alkylaminocarbonyl and di(lower-alkyl-)aminocarbonyl;

R_2 is F, Cl, Br, CN, $CONH_2$ COOH, COO-lower-alkyl or $(CH_2)_mNH_2$ where m is 0 or 1;

or a pharmaceutically accentable acid-addition salt thereof.

9. A composition for combating viruses which comprises an antivirally effective amount of a compound according to claim **1**, in admixture with a suitable carrier or diluent.

4,920,129

ANTI-ULCERATIVE IMIDAZOPYRIDINE COMPOUNDS

Youichi Shiokawa, Ibaraki; Masanobu Nagano, Kawanishi, and Hiromichi Itani, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Company, Ltd., Osaka, Japan

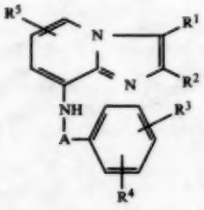
Filed Sep. 22, 1988, Ser. No. 247,657

Claims priority, application United Kingdom, Sep. 24, 1987, 8722488

Int. Cl.[5] **A61K** *31/4*; **C07D** *471/04*

U.S. Cl. 514—300 **14 Claims**

1. An imidazopyridine compound of the following formula:



(I)

wherein

R^1 is lower alkynyl,

R^2 is lower alkyl,

R^3 is lower alkyl,

R^4 is amino or acylamino,

R^5 is hydrogen; lower alkyl which may be substituted by halogen; nitro; amino; acylamino; esterified carboxy; or N,N-di (lower)alkylsulfamoyl, and

A is lower alkylene,

and a pharmaceutically acceptable salt thereof.

14. A method for the treatment of ulcers which comprises administering an effective amount of a compound of claim **1** or a pharmaceutically acceptable salt thereof to a human or animal.

4,920,130

QUINOLINE DERIVATIVES AND USE THEREOF AS ANTAGONISTS OF LEUKOTRIENE D_4

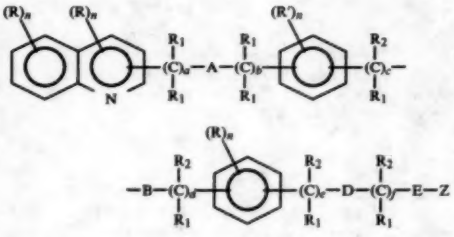
Fu-chi Huang, Gwynedd; Robert A. Galemmo, Jr., Ambler, and Henry F. Campbell, North Wales, all of Pa., assignors to Rorer Pharamceutical Corp., Fort Washington, Pa.

Filed Nov. 3, 1987, Ser. No. 116,597

Int. Cl.[5] **C07D** *215/12, 215/14, 403/02*; **A61K** *31/47*

U.S. Cl. 514—311 **22 Claims**

1. A compound of the formula



where:

A is O or S;

B is

D is O, S, NR_1,

or a chemical bond;

E is a chemical bond or

a is 0–2;

b is 0–1;

c is 0–2;

d is 0–3;

e is 0–4;

f is 0–5;

n is 0–2;

R is independently
hydrogen,
alkyl having 1 to 6 carbon atoms,
hydroxy,
alkoxy having 1 to 6 carbon atoms,
carboxy,
carbalkoxy wherein alkoxy has 1 to 6 carbon atoms,
halo,
nitro,
trifluoromethyl,
cyano,
acetyl,
propionyl or
benzoyl;

R' is independently
hydrogen,
alkyl having 1 to 6 carbon atoms,
hydroxy,
alkoxy having 1 to 6 carbon atoms,
halo or
trifluoromethyl;

R_1 is independently
hydrogen,
alkyl having 1 to 6 carbon atoms,
benzyl or
phenethyl;
R_2 is $-(CH_2)_x-X$;
where x is 0–3 and
X is hydrogen,
alkyl having 1 to 6 carbon atoms,
alkenyl having 2 to 6 carbon atoms,
cycloalkyl having 3 to 6 carbon atoms,
phenyl,
benzyl,
phenethyl,
hydroxy,
alkoxy having 1 to 6 carbon atoms,
aralkoxy wherein aryl is phenyl and alkoxy has 1 to 6 carbon atoms,
amino,
mono- and di-alkylamino having 1 to 6 carbon atoms,
benzylamino,
phenethylamino,
acetylamino,
propionylamino,
benzoylamino,
carbamyl,
carboxy,
carbalkoxy wherein alkoxy has 1 to 6 carbon atoms,
tetrazolyl,
N-acetylsulfonamido,
N-propionylsulfonamido or
N-benzoylsulfonamido;
vicinal R_2 groups together may be $(CH_2)_y-$ where y is 1–4, thus forming a 3–6 membered ring;
geminal R_1 and R_2 groups may together form a spiro substituent, $-(CH_2)_z-$, where z is 2 to 5;
geminal R_1 or R_1 and R_2 groups may together form an alkylidenyl substituent,

$$=CHR_1;$$

Z is $-COOR_1$;
$-CN$;

$$-CNHSO_2R_3$$ where R_3 is hydrogen,
alkyl having 1 to 6 carbon atoms,
trifluoromethyl,
phenyl or
benzyl;

$$-CN(R_1)_2;$$

$-OR_1$ or
tetrazolyl or substituted tetrazolyl where the substituent may be alkyl having 1 to 6 carbon atoms,
carboxyalkyl wherein alkyl has 1 to 6 carbon atoms, or
carbalkoxyalkyl wherein alkoxy has 1 to 6 carbon atoms and alkyl has 1 to 6 carbon atoms; and
pharmaceutically acceptable salts thereof.

21. A method for the treatment of hypersensitive ailments in a patient requiring such treatment which comprises administering to such patient an effective amount of a compound of the formula according to claim **1**.

4,920,131

QUINOLINE DERIVATIVES AND USE THEREOF AS ANTAGONISTS OF LEUKOTRIENE D_4

Fu-Chi Huang, Gwynedd; Robert A. Galemmo, Jr., Ambler, and Henry F. Campbell, North Wales, all of Pa., assignors to Rorer Pharmaceutical Corp., Ft. Washington, Pa.

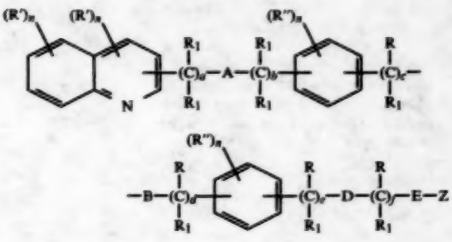
Continuation-in-part of Ser. No. 116,420, Nov. 3, 1987, and a continuation-in-part of Ser. No. 116,428, Nov. 3, 1987, and a continuation-in-part of Ser. No. 116,597, Nov. 2, 1987. This application Jun. 21, 1988, Ser. No. 209,428

The portion of the term of this patent subsequent to Apr. 24, 2004, has been disclaimed.

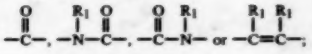
Int. Cl.[5] **C07D** *215/12, 215/14, 403/02;* **A61K** *31/47*

U.S. Cl. 514—311 **19 Claims**

1. A compound of the formula



where:
A is O or S;
B is a chemical bond, O, S, SO, SO_2, NR_1,



D is O, S, NR_1,

or a chemical bond;
E is a chemical bond or

a is 0–2;
b is 0–1;
c is 0–4;
d is 0–5;
e is 0–4;
f is 0–5;
n is 0–2;
R′ is independently
hydrogen,
alkyl having 1 to 6 carbon atoms,
hydroxy,
alkoxy having 1 to 6 carbon atoms,
carboxy,
carbalkoxy wherein alkoxy has 1 to 6 carbon atoms,
halo,
nitro,
trifluoromethyl,
cyano,
acetyl,
propionyl or
benzoyl;
R″ is independently
hydrogen,

hydroxy,
alkoxy having 1 to 6 carbon atoms,
halo,
trifluoromethyl,
$-CH_2R$,
$-CH_2-O-(CH_2)_x-X$ or
R;

R_1 is independently
hydrogen,
alkyl having 1 to 6 carbon atoms,
benzyl or
phenethyl;

R is
$-(CH_2)_x-X$,
$-O-(CH_2)_x-X$ (when not geminal to A or B when A or B is O);
$-S-(CH_2)_x-X$ or
$-NR_1-(CH_2)_x-X$ where x is 0-3; and

X is
hydrogen,
alkyl having 1 to 6 carbon atoms,
alkenyl having 2 to 6 carbon atoms,
cycloalkyl having 3 to 6 carbon atoms,
phenyl,
benzyl,
phenethyl,
hydroxy,
alkoxy having 1 to 6 carbon atoms,
aralkoxy wherein aryl is phenyl and alkoxy has 1 to 6 carbon atoms,
amino,
mono- and di-alkylamino having 1 to 6 carbon atoms,
benzylamino,
phenethylamino,
acetylamino,
propionylamino,
benzoylamino,
$-CONR_1R_1$,
$-COOR$,
$-CN$,
tetrazolyl,
acetylsulfonamido,
propionylsulfonamido or
benzoylsulfonamido;

vicinal R groups together may be $(CH_2)_y-$ where y is 1-4, thus forming a 3-6 membered ring;

geminal R_1 and R groups may together form a spiro substituent, $-(CH_2)_z-$, where z is 2 to 5;

geminal R_1 or R_1 and R groups may together form an alkylidenyl substituent,

$$=CHR_1;$$

Z is $-COOR_1$;
$-CN$;

$$-C(=O)NHSO_2R_3$$

where R_3 is
hydrogen,
alkyl having 1 to 6 carbon atoms,
trifluoromethyl,
phenyl or
benzyl;

$$-C(=O)N(R_1)_2;$$

$-OR_1$ or
tetrazolyl or substituted tetrazolyl where the substituent may be alkyl having 1 to 6 carbon atoms,
carboxyalkyl wherein alkyl has 1 to 6 carbon atoms, or
carbalkoxyalkyl wherein alkoxy has 1 to 6 carbon atoms and alkyl has 1 to 6 carbon atoms; and

pharmaceutically acceptable salts thereof.

18. A method for the treatment of hypersensitive ailments in a patient requiring such treatment which comprises administering to such patient an effective amount of a compound of the formula according to claim **1**.

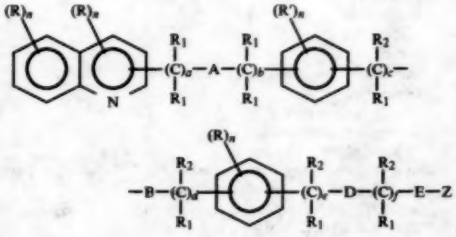
4,920,132

QUINOLINE DERIVATIVES AND USE THEREOF AS ANTAGONISTS OF LEUKOTRIENE D_4

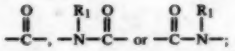
Fu-chi Huang, Gwynedd; Robert A. Galemmo, Jr., Ambler, and Henry F. Campbell, North Wales, all of Pa., assignors to Rorer Pharmaceutical Corp., Ft. Washington, Pa.

Filed Nov. 3, 1987, Ser. No. 116,420
Int. Cl.[5] **C07D** *215/12, 215/14, 403/02;* **A61K** *31/47*
U.S. Cl. 514—314 **43 Claims**

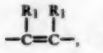
1. A compound of the formula



where:
A is O or S;
B is O, S, SO, SO_2, NR_1,



D is O, S, NR_1,



or a chemical bond;
E is a chemical bond or

a is 0-2;
b is 1-1;
c is 0-4;
d is 0-5;
e is 0-4;
f is 0-5;
n is 0-2;
R is independently
halogen,
alkyl having 1 to 6 carbon atoms,
hydroxy,
alkoxy having 1 to 6 carbon atoms,
carboxy,
carbalkoxy wherein alkoxy has 1 to 6 carbon atoms,

halo,
nitro,
trifluoromethyl,
cyano,
acetyl,
propionyl or
benzoyl;

R' is independently
hydrogen,
alkyl having 1 to 6 carbon atoms,
hydroxy,
alkoxy having 1 to 6 carbon atoms,
halo or
trifluoromethyl;

R_1 is independently
hydrogen,
alkyl having 1 to 6 carbon atoms,
benzyl or
phenethyl;

R_2 is $-(CH_2)_x-X$;
where x is 0-3 and

X is hydrogen,
alkyl having 1 to 6 carbon atoms,
alkenyl having 2 to 6 carbon atoms,
cycloalkyl having 3 to 6 carbon atoms,
phenyl,
benzyl,
phenethyl,
hydroxy,
alkoxy having 1 to 6 carbon atoms,
aralkoxy wherein aryl is phenyl and alkoxy has 1 to6 carbon atoms,
amino,
mono- and di-alkylamino having 1 to 6 carbon atoms,
benzylamino,
phenethylamino,
acetylamino,
propionylamino,
benzoylamino,
carbamyl,
carboxy,
carbalkoxy wherein alkoxy has 1 to 6 carbon atoms,
tetrazolyl,
acetylsulfonamido,
propionylsulfonamido or
benzylsulfonamido;

vicinal R_2 groups together may be $(CH_2)_y$—where y is 1-4, thus forming a 3-6 membered ring;

geminal R_1 and R_2 groups may together form a spiro substituent, $-(CH_2)_z-$, where z is 2 to 5; **geminal** R_1 or R_1 and R_2 groups may together form an alkylidenyl substituent,

Z is
—$COOR_1$;
—CN;

where R_3 is hydrogen,
alkyl having 1 to 6 carbon atoms,
trifluoromethyl,
phenyl or
benzyl;

—OR_1,
tetrazolyl or substituted tetrazolyl where the substituent may be alkyl having 1 to 6 carbon atoms,
carboxyalkyl wherein alkyl has 1 to 6 carbon atoms, or
carbalkoxyalkyl wherein alkoxy has 1 to 6 carbon atoms and alkyl has 1 to 6 carbon atoms; and

pharmaceutically acceptable salts thereof.

41. A method for the treatment of hypersensitive ailments in a patient requiring such treatment which comprises administering to such patient an effective amount of a compound of the formula according to claim **1**.

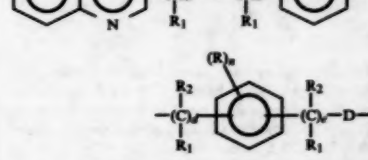
4,920,133

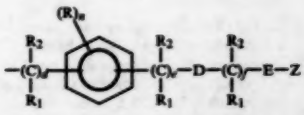
QUINOLINE DERIVATIVES AND USE THEREOF AS ANTAGONISTS OF LEUKOTRIENE D_4

Fu-chi Huang, Gwynedd; Robert A. Galemmo, Jr., Ambler, and Henry F. Campbell, North Wales, all of Pa., assignors to Rorer Pharmaceutical Corp., Fort Washington, Pa.

Filed Nov. 3, 1987, Ser. No. 116,428
Int. Cl.[5] **C07D** *215/12, 215/14, 403/07*; **A61K** *31/47*
U.S. Cl. 514—314 **22 Claims**

1. A compound of the formula





where:
A is O or S;
D is O, S, NR_1,

or a chemical bond;
E is a chemical bond or

a is 0-2;
b is 0-1;
d is 1-5;
e is 0-4;
f is 0-5;
n is 0-2;
R is independently hydrogen, alkyl having 1 to 6 carbon atoms, hydroxy, alkoxy having 1 to 6 carbon atoms, carboxy, carbalkoxy wherein alkoxy has 1 to 6 carbon atoms, halo, nitro, trifluoromethyl, cyano, acetyl, propionyl or benzoyl;
R' is independently hydrogen, alkyl having 1 to 6 carbon atoms, hydroxy, alkoxy having 1 to 6 carbon atoms, halo or trifluoromethyl;
R_1 is independently hydrogen, alkyl having 1 to 6 carbon atoms, benzyl or phenethyl;

R_2 is $-(CH_2)_x-X$; where x is 0–3 and

X is hydrogen, alkyl having 1 to 6 carbon atoms, alkenyl having 2 to 6 carbon atoms, cycloalkyl having 3 to 6 carbon atoms, phenyl, benzyl, phenethyl, hydroxy, alkoxy having 1 to 6 carbon atoms, aralkoxy wherein aryl is phenyl and alkoxy has 1 to 6 carbon atoms, amino, mono- and di-alkylamino having 1 to 6 carbon atoms, benzylamino, phenethylamino, acetylamino, propionylamino, benzoylamino, carbamyl, carboxy, carbalkoxy wherein alkoxy has 1 to 6 carbon atoms, tetrazolyl, acetylsulfonamido, propionylsulfonamido or benzoylsulfonamido;

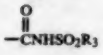
vicinal R_2 groups together may be $(CH_2)_y-$where y is 1–, thus forming a 3–6 membered ring;

geminal R_1 and R_2 groups may together form a spiro substituent, $-(CH_2)_z-$, where z is 2 to 5;

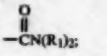
geminal R_1 or R_1 and R_2 groups may together form an alkylidenyl substituent,

Z is $-COOR_1$;

$-CN$;



where R_3 is hydrogen, alkyl having 1 to 6 carbon atoms, trifluoromethyl, phenyl or benzyl;



$-OR_1$ or tetrazolyl or substituted tetrazolyl where the substituent may be alkyl having 1 to 6 carbon atoms, carboxyalkyl wherein alkyl has 1 to 6 carbon atoms, or carbalkoxyalkyl wherein alkoxy has 1 to 6 carbon atoms and alkyl has 1 to 6 atoms; and

pharmaceutically acceptable salts thereof.

4,920,134

2-O-PYRIMIDINYL GLYCEROL DERIVATIVES

Keizo Inoue, Tokyo; Hiroaki Nomura, and Eiko Imamiya, both of Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

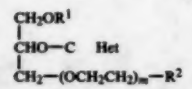
Filed Aug. 3, 1988, Ser. No. 227,550

Claims priority, application Japan, Aug. 7, 1987, 62-198455; Mar. 23, 1988, 63-70338

Int. Cl.[5] C07D *239/34*

U.S. Cl. 544—316 **12 Claims**

1. A compound having the formula:



(I)

wherein

represents pyrimidinyl, which is unsubstituted or substituted by halogen, C_{1-6} alkyl, C_{1-6} alkylthio, N-C_{1-6} alkylamino, N,N-di-C_{1-6} alkylamino, C_{1-6} alkoxy, hydroxy, hydroxy-C_{1-6} alkyl, amino-C_{1-6} alkyl, carbamoyl or ureido;

R^1 represents C_{10-20} alkyl which is unsubstituted or substituted by C_{3-8} cycloalkyl or up to 7 halogen atoms;

R^2 represents (i) a tertiary amino group of the formula:

wherein R^3 and R^4 independently represent C_{1-6} alkyl, or both, taken together with the adjacent nitrogen atom, form 1-pyrrolidinyl, piperidino, morpholino or 1-piperazinyl, each of said groups being unsubstituted or substituted by C_{1-6} alkyl, carboxy, C_{1-6} alkoxycarbonyl, mercapto, hydroxy, hydroxy-C_{1-6} alkyl, amino-C_{1-6} alkyl, carbamoyl or ureido, (ii) a quaternary ammonium group of the formula:

wherein R^3, R^4 and R^5 independently represent C_{1-6} alkyl, or R^3, R^4 and R^5, taken together with the adjacent nitrogen atom, form 1-pyridino, 3-oxazolio, 3-thiazolio, 1-C_{1-6} alkyl-3-imidazolio, 1-pyrimidino, 1-pyridazinio, 1-quinolinio, 2-isoquinolinio, 1-C_{1-6} alkyl-1-pyrrolidinio, 1-C_{1-6} alkyl-1-piperidinio, 4-C_{1-6} alkyl-4-morpholinio or 1-C_{1-6} alkyl-1-piperazinio, each of said groups being unsubstituted or substituted by C_{1-6} alkyl, carboxy, C_{1-6} alkoxycarbonyl, mercapto, hydroxy, hydroxy-C_{1-6} alkyl, amino-C_{1-6} alkyl, carbamoyl or ureido, (iii) a heterocyclic group containing a tertiary nitrogen atom selected from the class consisting of 1-(C_{1-6} alkyl)pyrrolidin-2- or 3-yl, 1-(C_{1-6} alkyl)piperidin-2-, -3- or -4-yl, 4-(C_{1-6} alkyl)morpholin-2- or -3-yl and 1-(C_{1-6} alkyl)piperazin-2- or -3-yl, each of said groups being unsubstituted or substituted by C_{1-6} alkyl, carboxy, C_{1-6} alkoxycarbonyl, mercapto, hydroxy, hydroxy-C_{1-6} alkyl, amino-C_{1-6} alkyl, carbamoyl or ureido, or (iv) a heterocyclic group containing a quaternary nitrogen atom selected from the class consisting of 1-(C_{1-6} alkyl)-2-, -3- or -4-pyridinio, 3-(C_{1-6} alkyl)-2-, -4- or -5-oxazolio, 3-(C_{1-6} alkyl)-2-, -4- or -5-thiazolio, 1-(C_{1-6} alkyl)-2-, -3-, -4-, -5-, -6-, -7- or -8-quinolinio, 2-(C_{1-6} alkyl)-1-, -3-, -4-, -5-, -6-, -7- or -8-isoquinolinio, 1,1-di(C_{1-6} alkyl)-2- or -3-pyrrolidinio, 1,1-di(C_{1-6} alkyl)-2-, -3- or -4-piperidinio, 4,4-di(C_{1-6} alkyl)-2- or -3-morpholinio and 1,1,4-tri(C_{1-6} alkyl)-2 or -3-piperazinio, each of said groups being unsubstituted or substituted by C_{1-6} alkyl, carboxy, C_{1-6} alkoxycarbonyl, mercapto, hydroxy, hydroxy-C_{1-6} alkyl, amino-C_{1-6} alkyl, carbamoyl or ureido; and

m represents 2 or 3; or a pharmaceutically acceptable salt thereof, wherein said compound represented by the formula (I) can be in the form of a pharmaceutically acceptable salt with an anion or an intramolecular salt with an anion in the molecule of said compound when R^2 represents a quaternary ammonium group or a heterocyclic group containing a quaternary nitrogen atom.

4,920,135
INSECTICIDAL UREAS AND THIOUREAS

Kobus Wellinga, and Rudolf Wulder, both of Weesp, Netherlands, assignors to Duphar International Research B.V., Weesp, Netherlands

Division of Ser. No. 867,695, May 28, 1986, Pat. No. 4,833,151, which is a continuation of Ser. No. 665,508, Oct. 30, 1984, Pat. No. 4,607,044, which is a continuation of Ser. No. 302,591, Sep. 15, 1981, abandoned, which is a continuation of Ser. No. 35,978, May 4, 1979, abandoned, which is a division of Ser. No. 717,633, Aug. 26, 1976, Pat. No. 4,166,124, which is a division of Ser. No. 522,058, Nov. 8, 1974, Pat. No. 3,989,842, which is a division of Ser. No. 354,393, Apr. 25, 1973, Pat. No. 3,933,908, which is a division of Ser. No. 143,668, May 14, 1971, Pat. No. 3,748,356.

This application Feb. 7, 1989, Ser. No. 306,928

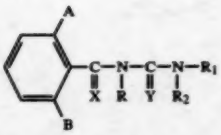
Claims priority, application Netherlands, May 15, 1970, 7007040

The portion of the term of this patent subsequent to Feb. 24, 1993, has been disclaimed.

Int. Cl.[5] A01N *43/30, 47/28*

U.S. Cl. 514—344 3 Claims

1. An insecticidal composition comprising an inert carrier and an insecticidally effective amount, as active ingredient, of a compound of the formula



wherein

A is a hydrogen atom, a halogen atom, a methyl group, or a methoxy group;

B also is a hydrogen atom, a halogen atom, a methyl group, or a methoxy group, with the proviso that A and B are not both a hydrogen atom;

R is a hydrogen atom, an alkyl group, a hydroxy group, an alkoxy group, an alkoxymethyl group, an acyl group, or an alkoxycarbonyl group;

X and Y each are an oxygen atom or a sulfur atom;

R_1 is a hydrogen atom, an alkyl group that may be substituted with halogen, with alkoxy, with alkylthio, or with cyano, a 1-cycloalkenyl group, a benzyl group that may be substituted with halogen, a hydroxy group, an alkoxy group, an acyl group, an alkoxycarbonyl group, an alkoxythiocarbonyl group, an alkylsulfonyl group, or a phenylsulfonyl group; and

R_2 is substituted or non-substituted phenyl group or a pyridyl group that may be substituted with halogen, with nitro, with cyano, or with halogenated alkyl;

with the proviso that the active ingredient comprises a compound that is not included in any of the following paragraphs:

(1) N-(2,6-dichlorobenzoyl)-N'-(4-cyanophenyl) urea;

(2) N-(2-monochlorobenzoyl)-N'-(3,4-dichlorophenyl) urea.

4,920,136
SUBSTITUTED PYRIDYLETHANOLAMINE LIVESTOCK PRODUCTION PROMOTERS

Hans Lindel, Leverkusen; Werner Hallenbach, Langenfeld, and Friedrich Berschauer, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

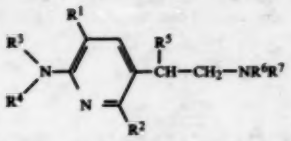
Filed Jul. 13, 1988, Ser. No. 218,740

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1987, 3725084

Int. Cl.[5] A61K *31/44;* C07D *213/84, 413/00*

U.S. Cl. 514—344 13 Claims

1. A substituted pyridylethanolamine derivative of the formula



in which

R^1 represents CN, $COOR^8$ or $CONR^9R^{10}$

R^2 represents C_{1-4}-alkyl,

R^3 represents hydrogen or C_{1-4}-alkyl,

R^4 represents hydrogen or C_{1-4}-alkyl,

R^5 represents OH, C_{1-6}-alkoxy, C_1–C_6-alkylcarbonyloxy, phenylcarbonyloxy, C_1–C_6-alkylsulphonyloxy, or phenylsulphonyloxy,

R^6 represents hydrogen or C_{1-6}-alkyl,

R^7 represents hydrogen, C_{1-6}-alkyl, C_{3-6}-cycloalkyl, C_{1-6}-alkylphenyl or phenyl each of which is optionally substituted by 1 to 5 halogen atoms, C_{1-6}-alkyl-phenyl which can optionally be substituted by halogen, C_{1-4}-alkyl, hydroxyl, C_{1-4}-alkoxy, or optionally halogen-substituted methylenedioxy or ethylenedioxy; C_{1-6}-alkyl-phenoxy which can optionally be substituted by halogen, C_{1-4}-alkyl, hydroxyl, C_{1-4}-alkoxy, or optionally halogen-substituted methylenedioxy or ethylenedioxy,

R^8 represents C_{1-6}-alkyl, and

R^9 and R^{10}, independently of one another, represent hydrogen or C_{1-4}-alkyl.

10. A livestock promoting composition comprising an amount effective therefor of a compound, salt or N-oxide according to claim 1 and a diluent.

4,920,137
METHOD FOR STABILIZING ISOTHIAZOLINONES

Jesse Segall, and Leonard M. Shorr, both of Haifa, Israel, assignors to Bromine Compounds Limited, Israel

Filed Jul. 21, 1988, Ser. No. 222,130

Claims priority, application Israel, Jul. 23, 1987, 83305; Jul. 15, 1988, 87111

Int. Cl.[5] A61K *31/425;* C07D *275/02*

U.S. Cl. 514—372 22 Claims

1. A method for stabilizing compositions comprising one or more 3-isothiazolinones, said method comprising

adding to a composition comprising said one or more 3-isothiazolinones, an amount effective to stabilize said one or more 3-isothiazolinones of one or more stabilizing compounds having the formula:

$$[R_xA\text{-}C_6H_2R^1R^2]_y\text{-}Z$$

wherein Z is selected from the group consisting of AR_x, R^1, R^2, alkoxymethylene, methylene and alkylidene; R, R^1 and R^2 are independently selected from the group consisting of hydrogen, straight-chained, branched and cyclic alkyl, aryl and arylalkyl; A is oxygen or nitrogen, provided that when A is oxygen, x is 0 or 1 and when A is nitrogen, x is 1 or 2; and y is

1 or 2, so that degradation of said one or more 3-isothiazolinones is inhibited.

16. In combination, a composition comprising one or more 3-isothiazolinones, and an amount effective to stabilize said one or more 3-isothiazolinones, of one or more stabilizing compounds having the formula:

$$[R_xA\text{-}C_6H_2R^1R^2]_y\text{-}Z$$

wherein Z is selected from the group consisting of AR_x, R^1, R^2, alkoxymethylene, methylene and alkylidine; R, R^1 and R^2 are independently selected from the group consisting of hydrogen, straight-chained, branched and cyclic alkyl, aryl and arylalkyl; A is oxygen or nitrogen, provided that when A is oxygen, x is 0 or 1 and when A is nitrogen, x is 1 or 2; and y is 1 or 2, so that degradation of said one or more 3-isothiazolinones is inhibited.

4,920,138

2(4-CHLOROBENZYL)1(1H-1,2,4-TRIAZOL-1-YL-METHYL-1-CYCLOHEPTANOL AND CYCLOHEXANOL

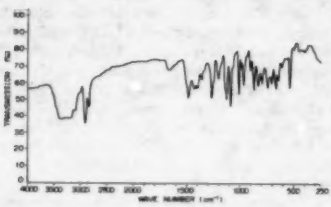
Atsushi Ito; Satoru Kumazawa; Nobuo Sato, and Toshihide Saishoji, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaishi, Chuo, Japan

Filed Jan. 10, 1989, Ser. No. 295,404

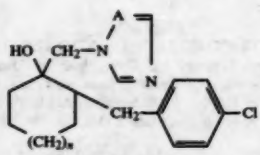
Claims priority, application Japan, Jan. 14, 1988, 63-6054

Int. Cl.[5] A01N *43/653*; C07D *249/12*

U.S. Cl. 514—383 **6 Claims**



1. An azole-substituted cycloalkanol derivative represented by the formula (I):



(I)

wherein n is an integer of 1 or 2 and A represents a nitrogen atom.

4,920,139

ALPHA-ALKYL-ALPHA-(4-HALOPHENYL)-1H-1,2,4-TRIAZOLE-1-PROPANENITRILE

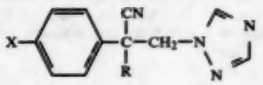
Ted T. Fujimoto, Churchville, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 551,732, Nov. 10, 1983, abandoned. This application Jun. 27, 1988, Ser. No. 211,957

Int. Cl.[5] A01N *43/653*; C07D *249/08*

U.S. Cl. 514—383 **15 Claims**

1. A compound of the formula



wherein X is a fluoro, chloro or bromo atom, R is $(C_3\text{-}C_8)$alkyl group wherein when R is branched, the branching does not occur at the alpha carbon of the R substituent and the agronomically acceptable enantiomorphs, acid addition and metal salt complexes thereof.

4,920,140

BENZIMIDAZOLE DERIVATIVES AND THEIR THEREAPEUTIC AND COSMETIC USE

Braham Shroot, Antibes; Jacques Eustache, Grasse, and Jean-Michel Bernardon, Le Rouret, all of France, assignors to Centre International de Recherches Dermatologiques C.I.R.D., Valbonne, France

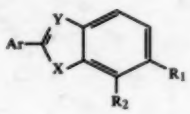
Division of Ser. No. 839,269, Mar. 13, 1986, Pat. No. 4,740,519, which is a continuation-in-part of Ser. No. 777,728, Sep. 19, 1985, abandoned. This application Mar. 24, 1988, Ser. No. 172,494

Claims priority, application Luxembourg, Sep. 19, 1984, 85544

Int. Cl.[5] A61K *31/41*; C07D *487/00*

U.S. Cl. 514—394 **15 Claims**

1. An aromatic heterocyclic compound having the formula



(I)

wherein

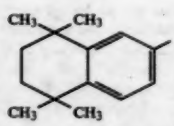
R_1 represents (i) $-CH_3$, (ii) $-CH_2OH$ or (iii)

R_3 represents hydrogen, $-OR_4$ wherein R_4 represents hydrogen, alkyl having 1–20 carbon atoms, mono- or polyhydroxyalkyl, or R_3 represents

wherein r'and r'' represent hydrogen, lower alkyl or r' and r'' together with the nitrogen atom to which they are attached form a pyrrolidino group,

R_2 represents hydrogen or $-CH_3$,

Ar represents an aromatic radical having one of the following formulas

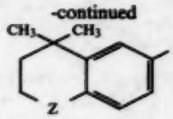


(A)

(a)

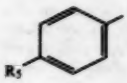
-continued

(b)



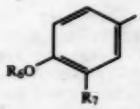
wherein Z is O or S,

(c)



wherein R_5 represents lower alkyl, and

(d)



where R_6 represents hydrogen or alkyl having 1–10 carbon atoms and R_7 represents branched alkyl having 4–12 carbon atoms or cycloalkyl,

Y represents a nitrogen atom, and

X represents —N—R_8 wherein R_8 represents hydrogen, lower alkyl or lower alkoxycarbonyl.

14. A pharmaceutical composition for enteral, parenteral, topical or ocular administration for the treatment of dermatologic ailments linked to a keratinization disorder comprising in a pharmaceutically acceptable vehicle an amount of the compound of claim 1 effective to treat said dermatologic ailments.

4,920,141

SYNERGISTIC BIOCIDES OF CERTAIN NITROIMIDAZOLES AND ALDEHYDES

Dennis G. Horstmann, St. Louis, and Douglas S. Jones, Kirkwood, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Continuation-in-part of Ser. No. 916,761, Oct. 5, 1986, abandoned. This application Feb. 24, 1988, Ser. No. 159,793

Int. Cl.[5] A01N *35/00, 35/02, 43/50*

U.S. Cl. 514—398 **8 Claims**

1. A bactericidal composition useful in treating industrial process water to inhibit and control the growth of sulfate-reducing bacteria comprising a synergistic bactericidally effective amount of a mixture of (a) a water-soluble salt of metronidazole, dimetridazole, secnidazole or ipronidazole and (b) glutaraldehyde, the weight ratio of component (a) to component (b) being between about 1:2 to 1:100.

4,920,142

FUNGICIDAL IMIDAZOLE DERIVATIVES

Tetsuya Imai, Naruto, and Hisashi Takao, Tokushima, both of Japan, assignors to Otsuka Kagaku Kabushiki Kaisha, Osaka, Japan

Filed Feb. 1, 1989, Ser. No. 304,630

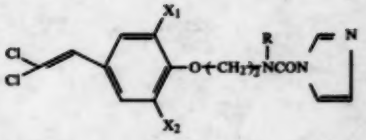
Claims priority, application Japan, Feb. 5, 1988, 63-26274

Int. Cl.[5] A01N *43/50*; C07D *233/56*

U.S. Cl. 514—399 **7 Claims**

1. An imidazole derivative represented by the formula

(B)



(C)

wherein R is lower alkyl, lower alkoxyalkyl, lower alkoxycarbonylmethyl or cyanomethyl, and X^1 and X^2 are each a hydrogen atom or halogen atom.

7. A fungicidal composition for agricultural and horticultural uses comprising an inert carrier and a fungicidally effective amount of an imidazole derivative defined in claim 1 as an active component thereof.

(D)

4,920,143

HYDRO-MONOBENZOPORPHYRIN WAVELENGTH-SPECIFIC CYTOTOXIC AGENTS

Julia G. Levy; David Dolphin, both of Vancouver; Jack K. Chow, Burnaby, and Ethan Sternberg, Vancouver, all of Canada, assignors to University of British Columbia, Vancouver, Canada

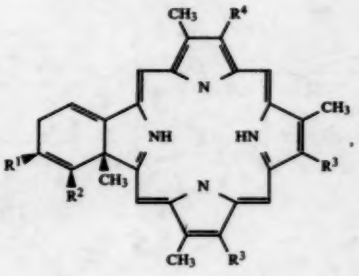
Continuation-in-part of Ser. No. 41,680, Apr. 23, 1987, which is a continuation-in-part of Ser. No. 5,204, Jan. 20, 1987. This application Jul. 19, 1988, Ser. No. 221,161

Int. Cl.[5] A61K *31/40*; C07D *437/22*

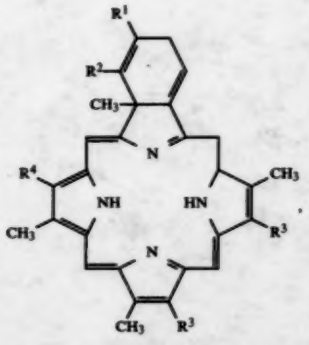
U.S. Cl. 514—410 **11 Claims**

1. A compound of the formula

1



2



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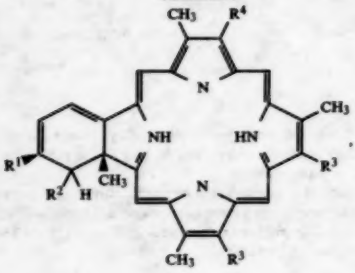
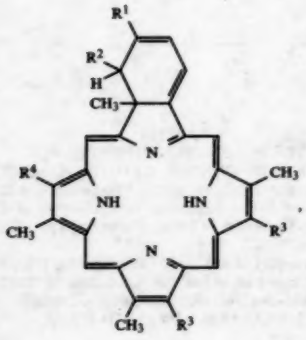
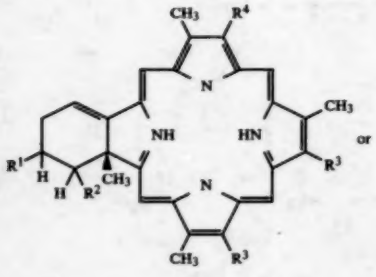
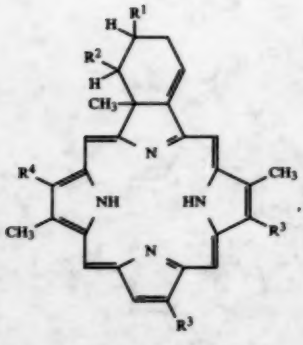






or



wherein
each R^1 and R^2 is independently selected from the group consisting of carbalkoxy (1–6C), alkyl (1–6C) sulfonyl, aryl sulfonyl, and aryl, and
each R^3 is independently $CH_2CH_2COOR^{3'}$ where $R^{3'}$ is H or
3 alkyl (1–6C); and
R^4 is $CHCH_2$, $CH_2OR^{4'}$, $CH(OR^{4'})CH_3$, $CH(OR^4)CH_2OR^{4'}$, $-CH(SR^{4'})CH_3$, $-CH(NR^{4'}{}_2)CH_3$, $-CH(CN)CH_3$, $-CH(COOR^{4'})CH_3$, $-CH(OOCR^{4'})CH_3$, $-CH(halo)CH_3$, and $-CH(halo)CH_2(halo)$, wherein $R^{4'}$ is H, alkyl (1–6C), with the proviso that if R^4 is $CHCH_2$, both $R^{3'}$, cannot be alkyl.

8. A pharmaceutical composition which is useful in targeting specific biological material which composition comprises an effective amount of the compound of claim **1** in admixture with at least one pharmaceutically acceptable excipient.

4

4,920,144

DERIVATIVES OF BICYCLIC AMINO ACIDS, AGENTS CONTAINING THEM AND THEIR USE AS HYPOTENSIVES

Hansjörg Urbach, Kronberg/Taunus; Rainer Henning, Hattersheim am Main, and Reinhard Becker, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 865,479, May 21, 1986, abandoned. This application Apr. 3, 1989, Ser. No. 332,338

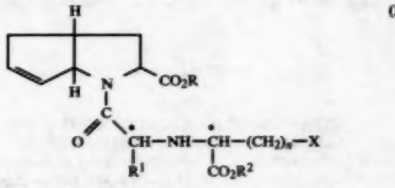
Claims priority, application Fed. Rep. of Germany, May 23, 1985, 3518514

Int. Cl.[5] **A61K** *31/40, 31/465;* **C07D** *403/12, 209/02*

U.S. Cl. 514—412 **12 Claims**

1. A compound of the formula I or a physiologically acceptable salt thereof

5 (I)



in which
n denotes 0, 1 or 2,
R denotes hydrogen, (C_1 to C_6)-alkyl or aralkyl having 7 to 9 carbon atoms,
6 R^1 denotes hydrogen or (C_1 to C_6)-alkyl which can optionally be substituted by amino, (C_1 to C_4)-acylamino or benzoylamino, (C_2 to C_6)-alkenyl, (C_5 to C_9)-cycloalkyl, (C_5 to C_9)-cycloalkenyl, (C_5 to C_7)-cycloalkyl-(C_1 to C_4)-alkyl, aryl or partially hydrogenated aryl, each of which can be substituted by (C_1 to C_4)-alkyl, (C_1 or C_2)-alkoxy or halogen, aryl-(C_1 to C_4)-alkyl or aroyl-C_1-alkyl, both of which can be substituted in the aryl radical as defined previously, or a side chain of a naturally occurring amino acid,
R^2 denotes hydrogen, (C_1 to C_6)-alkyl, (C_2 to C_6)-alkenyl or aryl-(C_1 to C_4)-alkyl,
X denotes (C_1 to C_4)-alkyl, (C_2 to C_6)-alkenyl, (C_5 to C_9)-cycloalkyl, aryl which can be monosubstituted, disubstituted or trisubstituted by (C_1 to C_4)-alkyl, (C_1 to C_4)-alkoxy, hydroxyl, halogen, nitro, amino, (C_1 to C_4)-alkylamino, di-(C_1 to C_4)-alkyl-amino or methylenedioxy, or 3-indolyl.

11. Method of treating high blood pressure which comprises administering an effective amount of a compound as or a salt thereof claimed in claim **1**.

4,920,145
WATER-SOLUBLE COMPLEXES OF WATER-INSOLUBLE PHARMACEUTICAL COMPOUNDS AND PREPARATION THEREOF

James R. Cho, Oakland; Terry E. Smith, Morristown, and Ian W. Cottrell, Kinnelon, all of N.J., assignors to GAF Chemical Corporation, Wayne, N.J.

Filed Feb. 29, 1988, Ser. No. 161,881
Int. Cl.[5] A61K 31/405, 31/41; C07D 209/28, 207/267
U.S. Cl. 514—420 18 Claims

1. An adduct of a substantially insoluble organic compound selected from the group consisting of indomethacin, dapsone, furosemide, and chlorhexidine and a liquid oligomer of N-vinyl-2-pyrrolidone, the water solubility of the adduct being at least about 25-fold that of the organic compound itself.

7. A method for preparing the adduct of claim 1 comprising preparing a suspension of an insoluble organic compound selected from the group consisting of indomethacin, dapsone, furosemide, and chlorhexidine in a liquid oligomer of N-vinyl-2-pyrrolidone, and heating the suspension at a temperature and for a period of time sufficient to dissolve the organic compound.

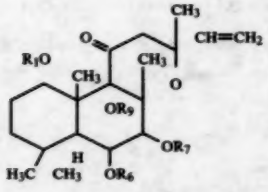
13. A method for preparing the adduct of claim 1 comprising preparing a suspension of an insoluble organic compound selected from the group consisting of indomethacin, dapsone furosemide, and chlorhexidine in an aqueous solution of a liquid oligomer of N-vinyl-2-pyrrolidone and heating the suspension at a temperature and for a time sufficient to dissolve the organic compound.

4,920,146
CARBAMOYLOXYLABDANE COMPOUNDS USEFUL IN REDUCING INTRAOCULAR PRESSURE

Raymond W. Kosley, Jr., Bridgewater; Robert J. Cherill, Somerset, both of N.J., and Gerard O'Malley, Newton, Pa., assignors to Hoechst Roussel Pharmaceuticals Inc., Somerville, N.J.

Continuation-in-part of Ser. No. 947,070, Dec. 29, 1986, abandoned. This application Dec. 28, 1987, Ser. No. 137,998
Int. Cl.[5] C07D 311/92
U.S. Cl. 514—437 49 Claims

1. A compound of the formula



wherein:

(a) R_1 is hydrogen; (b) R_9 is hydrogen;

(c) R_6 and R_7 independently are hydrogen, a group of the formula

wherein R_{20} is hydrogen or loweralkyl of 1 to 6 carbon atoms, or a group of the formula

wherein R_{13} is hydrogen, loweralkyl of 2 to 6 carbon atoms, hydroxyloweralkyl of 1 to 6 carbon atoms, loweralkoxyloweralkyl having 1 to 6 carbon atoms in the alkoxy group and 2 to 6 carbon atoms in the alkyl group; or a group of the formula $HOCH_2CH(OH)CH_2$—; R_{14} is hydrogen, hydroxyl, loweralkoxy of 1 to 6 carbon atoms, loweralkyl of 1 to 6 carbon atoms, hydroxyloweralkyl of 2 to 6 carbon atoms, loweralkoxyloweralkyl of 1 to 6 carbon atoms in alkoxy group and 2 to 6 carbon atoms in the alkyl group, loweralkanoyl of 2 to 6 carbon atoms, loweralkanoyllooeralkyl of 2 to 6 carbon atoms in the alkanoyl group and 1 to 6 carbon atoms in the alkyl group,

a group of the formula —$(CH_2)_tNR_{21}R_{22}$ wherein R_{21} and R_{22} are independently loweralkyl of 1 to 6 carbon atoms and t is 0, or 2 to 6,

a group of the formula OR_{23} wherein R_{23} is hydrogen, loweralkyl of 1 to 6 carbon atoms, a group of the formula $(CH_2)_{t'}NR_{21}R_{22}$ wherein t' is 2 to 6, R_{21} and R_{22} are as above, a group of the formula

wherein R_{24} is hydrogen, loweralkyl of 1 to 6 carbon atoms, lowercycloalkyl of 3 to 6 carbon atoms, loweralkenyl of 2 to 6 carbon atoms, haloloweralkenyl of 2 to 6 carbon atoms, loweralkanoylloweralkyl of 2 to 6 carbon atoms in the alkanoyl group and 1 to 6 carbon atoms in the alkyl group, loweralkoxyloweralkyl of 1 to 6 carbon atoms in each group, loweralkoxycarbonylloweralkyl of 1 to 6 carbon atoms in each group, loweralkylamino of 1 to 6 carbon atoms, lowerdialkylamino of 2 to 6 carbon atoms,

a group of the formula $(CH_2)_uN(R_{25})COR_{26}$ wherein u is 1, 2 or 3 and R_{25} and R_{26} are independently hydrogen or loweralkyl of 1 to 6 carbon atoms, a group of the formula

wherein R_{27} and R_{28} are loweralkyl of 1 to 6 carbon atoms, with the provisos:

(e) that R_1, R_6 and R_7 are not simultaneously hydrogen,

(f) that when R_1 and R_6 are hydrogen, R_7 is not

(g) that R_6 and R_7 are not simultaneously

(h) that when r is 1, either R_6 or R_7 is

(i) that when R_1 and R_6 are hydrogen, R_{13} or R_{14} are not simultaneously loweralkyl of 1 to 6 carbon atoms, and

(h) that when R_1 and R_9 taken together from a group of the formula CO, SO, or $CHNR_{11}R_{12}$, R_6 and R_7 are not simultaneously hydrogen; the optical or geometric isomers thereof; or the pharmaceutically acceptable salts thereof.

17. A method of reducing intraocular pressure in mammals effective comprising administering to a mammal requiring intraocular pressure reduction, an intraocular pressure reducing effective amount of a compound of claim 1.

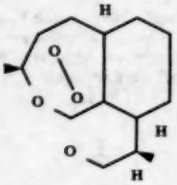
4,920,147

DEOXOARTEMISININ: NEW COMPOUND AND COMPOSITION FOR THE TREATMENT OF MALARIA

James D. McChesney, Rte. 1, Box 340, Etta, Miss. 38627, and Mankil Jung, 81 Jeff St., Oxford, Miss. 38655

Filed Mar. 28, 1989, Ser. No. 329,669
Int. Cl.[5] A61K *31/335*; C07D *321/02*
U.S. Cl. 514—450 **3 Claims**

1. The compound deoxoartemisinin having the formula:



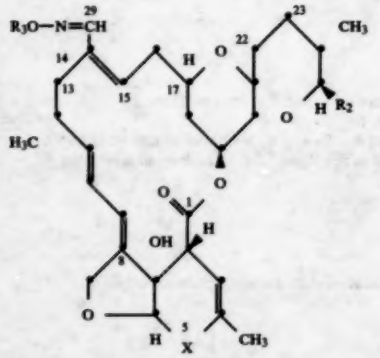
4,920,148

INSECTICIDES AND PARASITICIDES

Jean-Claude Gebret, Aesch, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 160,237, Feb. 25, 1988, Pat. No. 4,855,317. This application Jun. 21, 1989, Ser. No. 369,436
Claims priority, application Switzerland, Mar. 6, 1987, 847/87
Int. Cl.[5] A61K *31/365*; C07D *493/22*
U.S. Cl. 514—450 **11 Claims**

1. A compound of the formula

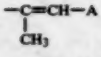


wherein

X is a group selected from —C(O)— and —C(=N—OR)—,

R is hydrogen, a OH protective group, an alkyl, cycloalkyl or acyl group,

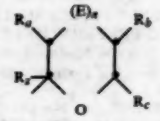
R_2 is methyl, ethyl, isopropyl, sec-butyl or the



group, wherein

A is methyl, ethyl or isopropyl; and

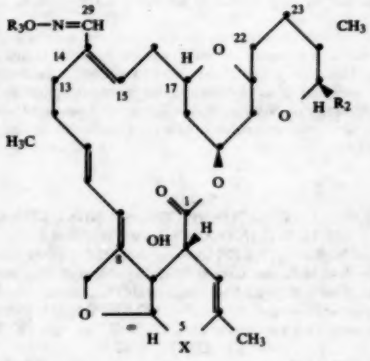
R_3 is hydrogen, C_1–C_6alkyl, C_2–C_6alkenyl, a radical selected from the group consisting of phenyl and benzyl which is unsubstituted or substituted by one or more members selected from the group consisting of halogen, C_1–C_3alkyl, C_1–C_3alkoxy, C_1–C_3alkylthio, C_1–C_3haloalkyl, nitro or cyano, or is the group U



(U)

wherein n is 0, 1, 2, 3, 4 or 5, E is oxygen or —CH(R_d)—, R_z is hydrogen, R_a is hydrogen, halogen, C_1–C_3alkyl, C_1–C_3alkoxy or 2-tetrahydropyranyl, and R_b, R_c and R_d are each independently hydrogen, halogen, C_1–C_3alkyl or C_1–C_3alkoxy, which group U may also be in unsaturated form.

9. A method of controlling parasites of animals or harmful insects, which comprises applying to said parasites, to said insects or to the locus thereof, an insecticidally effective amount of a compound of the formula

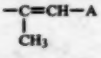


wherein

X is a group selected from —C(O)— and —C(=N—OR)—,

R is hydrogen, a OH protective group, an alkyl, cycloalky or acyl group,

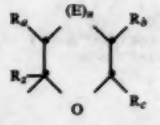
R_2 is methyl, ethyl, isopropyl, sec-butyl or the



group, wherein

A is methyl, ethyl or isopropyl, and

R_3 is hydrogen, C_1–C_6alkyl, C_2–C_6alkenyl, a radical selected from the group consisting of phenyl and benzyl which is unsubstituted or substituted by one or more members selected from the group consisting of halogen, C_1–C_3alkyl, C_1–C_3alkoxy, C_1–C_3alkylthio, C_1–C_3haloalkyl, nitro or cyano, or is the group U



(U)

wherein n is 0, 1, 2, 3, 4 or 5, E is oxygen or —CH(R_d)—, R_z is hydrogen, R_a is hydrogen, halogen, C_1–C_3alkyl, C_1–C_3alkoxy or 2-tetrahydropyranyl, and R_b, R_c and R_d are each independently hydrogen, halogen, C_1–C_3alkyl or C_1–C_3alkoxy, which group U may also be in unsaturated form.

4,920,149

COUGH/COLD MIXTURES COMPRISING NON-STEROIDAL ANTI-INFLAMMATORY DRUGS

Abraham Sunshine, New York; Eugene M. Laska, Larchmont, and Carole E. Siegel, Mamaroneck, all of N.Y., assignors to Analgesic Associates, Larchmont, N.Y.

Division of Ser. No. 887,205, Jul. 21, 1986, Pat. No. 4,738,966, which is a division of Ser. No. 752,546, Jul. 8, 1985, Pat. No. 4,619,934, which is a division of Ser. No. 598,502, Apr. 9, 1984, Pat. No. 4,552,899. This application Jan. 15, 1988, Ser. No. 144,099

Int. Cl.[5] A61K *31/19, 31/20*

U.S. Cl. 514—557 19 Claims

1. A method for the treatment of cough, cold, cold-like and/or flu symptoms in a mammalian organism in need of such treatment, comprising administering to such organism a pharmaceutical composition comprising (i) an analgesically and anti-inflammatory effective amount of a non-narcotic analgesic constitunt consisting essentially of at least one of the propionic acid NSAID's, benoxaprofen, flurbiprofen, fenoprofen, fenbufen, ketoprofen, indoprofen, pirporfen carprofen, oxaprozn, pranoprofen, microprofen, tioxaprofen, suprofen, alminoprofen, tiaprofenic acid, fluprofen, bucloxic acid or pharmaceutically acceptable salt thereof, in combinatory immixture with (ii) an antitussive effective amount of at least one of the antitussives caraminophen and dextromethorphan, or pharmaceutically acceptable salt thereof.

4,920,150

METHOD FOR PRODUCTION OF STABILIZED SODIUM ASCORBATE POWDER

Tadashi Hanaoka, Toyonaka; Yoshimi Kondō, Kudamatsu, and Ikuo Isobe, Hikari, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Oct. 17, 1988, Ser. No. 258,862

Claims priority, application Japan, Oct. 15, 1987, 62-261277

Int. Cl.[5] A61K *31/34*

U.S. Cl. 514—474 4 Claims

1. A method for production of stabilized sodium ascorbate powder, which comprises pulverizing crystals of sodium ascorbate, immediately followed by drying said crystals to a powder temperature of 40°–80° C.

4,920,151

MICROBICIDAL AGENTS BASED ON ALKYL-DI-GUANIDINIUM SALTS

Karl H. Wallhäusser, Hofheim am Taunus; Martin Hille, Liederbach; Hans-Walter Bücking, Kelkheim, and Manfred Hofinger, Burgkirchen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

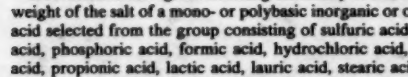
Continuation of Ser. No. 902,166, Aug. 29, 1986. This application Feb. 2, 1988, Ser. No. 157,068

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1985, 3531356

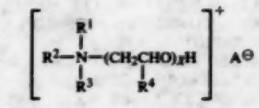
Int. Cl.[5] A01N *33/12, 37/52*

U.S. Cl. 514—634 2 Claims

1. A microbicidal agent consisting essentially of 5 to 50% by weight of the salt of a mono- or polybasic inorganic or organic acid selected from the group consisting of sulfuric acid, nitric acid, phosphoric acid, formic acid, hydrochloric acid, acetic acid, propionic acid, lactic acid, lauric acid, stearic acid, and oleic acid and an alkyl-di-guanidine of the formula



in which R′ and R″ denote hydrogen or C_8–C_{18}-alkyl, and R′ and R″ may not simultaneously be hydrogen, m denotes a number from 2 to 6 and n denotes 0 or 1, 5 to 50% by weight of a quaternary ammonium compound of the formula



in which R^1 denotes C_8–C_{22}-alkyl or C_8–C_{22}-alkenyl, R^2 and R^3 denote C_1–C_4-alkyl or C_2–C_3-hydroxyalkyl and R^4 denotes hydrogen or methyl, or R^1 and R^2 denote C_8–C_{12}-alkyl, R^3 denotes C_1–C_4-alkyl or C_2–C_3-hydroxyalkyl and R^4 denotes hydrogen or methyl, X denotes a number from 1 to 3, and A^- denotes an anion of a carboxylic acid selected from the group consisting of propionic acid, lactic acid, glycolic acid, tartronic acid, malic acid, tartaric acid, citric acid, maleic acid and benzoic acid, and, as the remainder, water, a lower alcohol, and a water-soluble glycol.

4,920,152

REVERSED-PHASE PACKING MATERIAL AND METHOD

Frederick E. Regnier, West Lafayette, Ind., and William Kopaciewicz, Ipswich, Mass., assignors to Purdue Research Foundation, West Layfayette, Ind.

Filed May 13, 1986, Ser. No. 862,750

Int. Cl.[5] C08F *8/46*; B01D *15/08*

U.S. Cl. 521—31 41 Claims

1. A process for producing a reversed-phase material comprising the steps of:

(a) providing a support material having a surface with an affinity for an adsorbate;

(b) contacting the surface of said support material with an adsorbate comprising reactive primary and/or secondary amine groups such that a pellicular coating of said adsorbate is adsorbed to said surface by electrostatic forces;

(c) crosslinking said adsorbed coating by reacting a portion of said reactive amine groups of said coating with a first hydrophobic reagent; and

(d) producing a reversed-phase material by reacting at least one remaining reactive amine group of said crosslinked adsorbed coating with an amount of a second hydrophobic reagent sufficient to render the amine neutral at acidic pH.

4,920,153

EXPANDABLE THERMOPLASTIC RESIN BEADS

Richard B. Allen, Pittsfield, Mass.; William E. Gibbs, Chesapeake, Va., and Lynn M. Hans, Pittsfield, Mass., assignors to General Electric Company, Selkirk, N.Y.

Division of Ser. No. 232,900, Aug. 16, 1988, Pat. No. 4,874,796, which is a division of Ser. No. 62,004, Jun. 12, 1987, Pat. No. 4,782,098. This application Jul. 24, 1989, Ser. No. 384,774

Int. Cl.[5] C08J *9/18, 9/22*

U.S. Cl. 521—60 7 Claims

1. A composition comprising discrete particles of an interpolymer of from 1 to 50 parts by weight of a polyphenylene ether resin and from 99 to 50 parts by weight a polymerized vinyl aromatic monomer per 100 parts by weight of resin and monomer imbibed under pressure with an easily volatilizable hydrocarbon or halogenated hydrocarbon blowing agent, said blowing agent being present in an amount sufficient to foam said interpolymer to a density less than about 20 lbs./ft^3.

4,920,154

SUBSTANTIALLY CLOSED CELL SHAPED HARD PHENOL FOAM AND METHOD FOR PREPARING THAT PHENOL FOAM

Joost Monstrey, Knokke-Heist, and Bart Wallaeys, Gent, both of Belgium, assignors to Recticel, Brussels, Belgium

Filed Apr. 14, 1989, Ser. No. 338,072
Claims priority, application Belgium, Jan. 3, 1989, 08900003
Int. Cl.[5] C08J 9/14
U.S. Cl. 521—131 8 Claims

1. In a method for preparing a substantially closed cell shaped foam which comprises a condensation product between an unsubstituted phenol or a phenol derivative and an aldehyde using a blowing agent for forming the rigid phenolic resin foam, the improvement wherein the blowing agent comprises chloropropane.

4,920,155

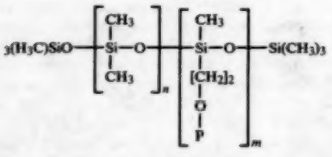
ORGANOMINERAL FOAMED MATERIALS AND PROCESSES FOR THEIR PREPARATION

Harald Bode, Kamen, Fed. Rep. of Germany, assignor to F. Willich Berg-und Bautechnik GmbH & Co., Fed. Rep. of Germany

Filed Jul. 22, 1987, Ser. No. 76,305
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1986, 3625278
Int. Cl.[5] C08G 77/00
U.S. Cl. 521—154 8 Claims

1. A process for preparing organomineral foamed materials by reacting a polyisocyanate with an alkali silicate solution in the presence of a catalyst, characterized by carrying out the reaction in a molar ratio of NCO groups in the polyisocyanate to Me_2O groups in tha alkali silicate solution of >2 in the presence of a hydrophobic polysiloxane and polyether block copolymer of general formula I

I



where P means a group of the formula

$$-(C_2H_4O)_x(C_3H_6O)_y-R$$

in which R represents a hydrogen atom or an alkyl group and n, m, x and y are integers giving the respective degree of polymerization, the polysiloxane block being linked to the polyether block by a non-hydrolysable SiC bond and the proportion of ethylene oxide units in the polyether block being 30 to 80%; wherein the process is carried out without the addition of a physical foaming agent.

4,920,156

BLENDS OF CYCLIC VINYL ETHER CONTAINING COMPOUNDS AND URETHANE ACRYLATES

Joseph V. Koleske, and Claiborn L. Osborn, both of Charleston, W. Va., assignors to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Filed Mar. 23, 1984, Ser. No. 592,838
Int. Cl.[5] C08F 2/50, 220/58, 232/04, 232/06
U.S. Cl. 522—31 18 Claims

1. A photocurable coating composition comprising a dihydropyranyl or di(dihydropyranyl) compound; a urethane acrylate prepared by reacting a polyol and a multi-functional isocyanate with a lactone-acrylate adduct or hydroxyalkyl acrylate or mixture thereof; and a photoinitiator selected from the group consisting of aromatic iodonium salts of halogen-containing complex ions, and aromatic onium salts of Group IIIA, VA and VIA elements.

4,920,157

RADIATION-CURABLE CONTACT ADHESIVES BASED ON POLYURETHANE ACRYLATES

Günther Schulz, Ludwigshafen; Wolfgang Druschke, Dirmstein, and Helmut Jaeger, Bobenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 15, 1988, Ser. No. 168,464
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1987, 3709920
Int. Cl.[5] C08F 20/34, 20/56
U.S. Cl. 522—96 12 Claims

1. A radiation-curable contact adhesive, comprising:

(A) an oligomeric or polymeric reaction product having a molecular weight of from about 500 to 100,000 of:

(a) a diisocyanate;

(b) from 20–99 equivalent %, based on component (a), of a polyesterol or polyetherol or a combination thereof;

(c) from 0–60 equivalent %, based on component (a), of a diol of 2 to 50 carbon atoms;

(d) a hydroxyalkyl (meth)acrylate of 2 to 20 carbon atoms in the alkyl radical; and

(e) a monohydroxyalkylcarboxylic acid having substantially no tendency to form a lactone; and

(B) from 2–90% by weight, based on the total amount of components A and B, of at least one monovinyl compound selected from the group consisting of monovinyl compounds which are capable of being self-polymerized to form a polymer having a glass transition temperature below about 20° C.;

and wherein the total amount of components (b), (c), (d) and (e) is equivalent in terms of OH groups to the amount of component (a), the amount of components (d) and (e) together is from 1 to 50 equivalent %, based on component (a), and the equivalent ratio of components (d):(e) is from about 1:9 to 9:1.

4,920,158

HYDROGEL-FORMING WOUND DRESSING OR SKIN COATING MATERIAL

Douglas G. Murray, Willowdale; Dennis C. Smith, Toronto, and James E. Guillet, Don Mills, all of Canada, assignors to Medipro Sciences Limited, Ontario, Canada

Filed Aug. 22, 1988, Ser. No. 234,726
Int. Cl.[5] C08L 13/00
U.S. Cl. 523—111 25 Claims

1. A hydrogel-forming wound dressing of skin coating material suitable for household, clinical and veterinary use, consisting substantially entirely of wound and skin compatible ingredients and comprising a first, hydrophilic polymer selected from the group consisting of polymers or copolymers of acrylic acid, polymers or copolymers of methacrylic acid, polymers or copolymers of itaconic acid, polymers or copolymers of maleic acid and polymers or copolymers of 3-butene-1,2,3-tricarboxylic acid, and combinations thereof; a second hydrophilic polymer which is selected from the group consisting of polyethylene oxide and copolymers of ethylene oxide and propylene oxide; a crosslinking agent for the first hydrophilic polymer to effect crosslinking thereof on drying; and water; the material forming a croslinked hydrogel of improved water resistance on drying; the material being film forming and substantially transparent, although capable of being made opaque.

4,920,159

FRICTION RESISTANT COMPOSITION

Sajal Das, Parsippany; Dusan C. Prevorsek, Morristown, both of N.J.; Seong K. Rhee, Northville, Mich., and William J. Bulger, Clifton Park, N.Y., assignors to Allies-Signal Inc., Morristown, N.J.

Continuation of Ser. No. 138,734, Dec. 28, 1987, abandoned. This application Jan. 11, 1989, Ser. No. 296,420

Int. Cl.[5] C08K 3/36; C08J 5/14

U.S. Cl. 523—153 25 Claims

1. A composition comprising friction resistant filler; and at least a sufficient amount of phenolic cyanate resin to bind the friction resistant filler, the resin having substantially no smoke generation during gel time measurement at 155° C.

4,920,160

POLYMERIC PARTICLES AND THEIR PREPARATION

Gerald K. Chip, Scarborough, and Alfred Rudin, Waterloo, both of Canada, assignors to Tioxide Group PLC, London, England

Division of Ser. No. 218,271, Jul. 13, 1988, Pat. No. 4,863,973. This application Jul. 10, 1989, Ser. No. 377,253

Claims priority, application United Kingdom, Jul. 30, 1987, 8718036

Int. Cl.[5] C08J 9/28; C08F 265/04

U.S. Cl. 523—201 14 Claims

1. A process for the preparation of core/sheath polymer particles which comprises establishing a monomer system of at least one ethylenically unsaturated monomer with acid functionality, polymerising said system in the form of an aqueous emulsion to form core particles, establishing an aqueous dispersion of said core particles and a nonionic monoethylenically aromatic substituted monomer or a mixture of monomers containing more than 25 mole per cent of said nonionic monomer and said nonionic monomer or mixture of monomers being free of polymerisable acid groups and effecting polymerisation of said nonionic monomer or monomer mixture to deposit on said core particles a hard sheath free of acid groups, mixing said core/sheath particles so formed with a non-volatile fixed or permanent base in the absence of organic solvent to swell said cores to generate therein one or more voids.

4,920,161

HIGH STRENGTH EPOXY TOOLING COMPOSITIONS

Chen-Shih Wang, Troy; Richard P. Atkins, Utica; Elio Eusebi, and Thomas J. Dearlove, both of Troy, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 24, 1988, Ser. No. 243,888

Int. Cl.[5] C08L 63/02; C08K 7/00

U.S. Cl. 523—220 5 Claims

1. A high strength, low shrinkage, room temperature curable epoxy tooling composition for use in cast-to-size forming tools for metal sheets comprising a bisphenol A epoxy, a polyoxypropylene amine catalyst, and a filler system containing no less than three different sized particulate fillers of which the average size of the smaller filler is about six to ten times smaller than the average size of the next size larger filler, said composition being fully curable into a rigid article having a tensile strength of at least 40 MPa and a compressive strength of at least 100 MPa.

4,920,162

ELECTROCOATING COMPOSITION OF A POLYAMINE SELF-CONDENSED EPOXY ADDUCT AND COATINGS PRODUCED THEREBY

Peter D. Clark, 25888 Rutledge Crossing, Farmington Hills, Mich. 48331; John A. Gilbert, 32855 Bellvine Trail, Beverly Hills, Mich. 48010; Gunther Ott, Van-Holte-Strasse 101 a, 4400 Munster, Fed. Rep. of Germany; Dieter Rühl, Hittorfstrasse 57, 4400 Munster, Fed. Rep. of Germany, and David J. Santure, Hummelbrink 13, 4400 Munster, Fed. Rep. of Germany

Filed Dec. 22, 1988, Ser. No. 288,327

Int. Cl.[5] C08L 63/00

U.S. Cl. 523—400 26 Claims

1. A coating composition comprising:

a principal resin comprising a self-addition epoxide resin-polyamine adduct with pendant alkylphenoxy groups;

a cross-linker comprising a blocked polyisocyanate compound;

a grind resin comprising the reaction product of an aromatic diepoxide, a bis (aromatic alcohol), a polyglycolamine, a diamine and an alkaryl monoepoxide;

a plasticizer; and

pigments selected from a group consisting of inorganic, organometallic and organic compounds.

4,920,163

IONIZABLE PAINTS FOR USE ESPECIALLY AS ANTI-LIGHTNING PAINTS

Jean-Claude Guillaumon, Ayguesvives, and Louis J. C. Blet, Corranssac, both of France, assignors to Centre Nationale d'Etudes Spatiales, France

Filed Jul. 22, 1988, Ser. No. 222,750

Claims priority, application France, Jul. 24, 1987, 87 10536

Int. Cl.[5] C08K 3/24

U.S. Cl. 523—440 18 Claims

1. An ionizable paint comprising a film-forming binder and an ionizable pigment comprising at least one of an alkali metal salt and an alkaline earth metal salt of a mono- or polyfunctional organic acid, said salt having a first ionization potential between 3.89 and 6.2 volts and said ionizable pigment comprising 20 to 100% by weight of total pigment in said paint.

4,920,164

EPOXY RESIN COMPOSITION

Yukio Sasaki, Roslyn, N.Y.; Takayuki Watanabe, Matsudo, Japan; Hiroshi Takamiya, Kamisu, Japan; Kazuo Watanabe, Osaka, Japan, and Yoko Yamazaki, Nagaoyama, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Jul. 20, 1988, Ser. No. 221,914

Claims priority, application Japan, Jul. 20, 1987, 62-179184

Int. Cl.[5] C08L 63/00

U.S. Cl. 523—466 8 Claims

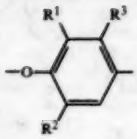
1. An epoxy resin composition consisting essentially of

(A) an epoxy resin,

(B) a curing agent,

(C) 0.01 to 10 parts by weight of a curing promoter per 100 parts by weight of the epoxy resin (A),

(D) 1 to 100 parts by weight of a polyphenylene ether resin per 100 parts by weight of the epoxy resin (A) and the curing agent (B) combined, said polyphenylene ether resin being a homopolymer or copolymer composed essentially of at least one kind of recurring units of the formula



in which R^1, R^2 and R^3 are identical or different and each represents hydrogen or alkyl having 1 to 3 carbon atoms, provided that R^1 and R^2 are not hydrogen at the same time, and

(E) 50 to 1,000 parts by weight of a silica powder per 100 parts by weight of the epoxy resin (A), the curing agent (B) and the polyphenylene ether resin (D) combined, said filler being at least one silica selected from the group consisting of crystalline silica and amorphous silica.

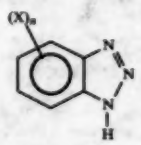
4,920,165

SCORCH RETARDER FOR HALOGENATED ELASTOMERS

Wolfgang Warrach, Cannonsburg, and Mark S. Reed, Zelienople, both of Pa., assignors to Mobay Corporation, Pittsburgh, Pa.

Filed Jul. 7, 1987, Ser. No. 71,123
Int. Cl.[5] C08K *5/34*
U.S. Cl. 524—91 **11 Claims**

1. A vulcanizable composition comprising a halogenated butyl rubber compound and a sufficient amount of triazole to retard the scorch of said composition, said triazole conforming to



wherein

X is a C_1–C_6 alkyl and

n is 0 to 4.

4,920,166

FLAME-RESISTANT, ANTISTATIC POLYCARBONATE MOLDING COMPOSITIONS

Hans-Josef Buysch; Norbert Schön, both of Krefeld, Fed. Rep. of Germany; Hans-Jürgen Kress, Pittsburgh, Pa.; Herbert Eichenauer, Dormagen, and Josef Buekers, Krefeld, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Continuation of Ser. No. 175,343, Mar. 31, 1988, abandoned. This application May 8, 1989, Ser. No. 348,397
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1987, 3713164; Apr. 17, 1987, 3713157; Aug. 15, 1987, 3727251
Int. Cl.[5] C08K *5/53, 5/52*
U.S. Cl. 524—141 **10 Claims**

1. Thermoplastic molding composition containing

A. 20 to 90 parts by weight of a thermoplastic aromatic polycarbonate,

B. 0 to 50 parts by weight of a graft polymer of

B.1. 5 to 90 parts by weight of a mixture of

B.1.1. 50 to 95% by weight styrene, α-methyl styrene, nucleus-substituted styrene, methyl methacrylate or mixtures thereof and

B.1.2 50 to 5% by weight (meth)acrylonitrile, methyl methacrylate, maleic anhydride, N-substituted maleic imide or mixtures thereof, on

B.2 95 to 10 parts by weight of a rubber having a glass transition temperature T_G of ≦10° C.,

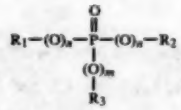
C. 5 to 70 parts by weight of a thermoplastic copolymer

C.1. 50 to 95% by weight styrene, α-methyl styrene, nucleus-substituted sytrene, methyl methacrylate or mixtures thereof and

C.2. 50 to 5% by weight (meth)acrylonitrile, methyl methacrylate, maleic anhydride, N-substituted maleic imide or mixtures thereof,

D. 0 to 15 parts by weight of a low molecular weight or high molecular weight bromine compound, based on 100 parts by weight of A.+B+C. and D. selected from the group consisting of decabromodiphenylether, octabromodiphenyl, octabromodiphenylether, tribromotetrachlorotoluene, oligocarbonates based on tetrabromobisphenol-A, high molecular weight polycarbonates based on tetrabromobisphenol-A and nucleus brominated polyphenylene oxides, the bromine content resulting from components A.+D. being between 3 and 10% by weight, based on the total weight of components A.+D.,

E. 1 to 20 parts by weight, based on 100 parts by weight A.+C. and, optionally, B. and/or D., of a phosphorus compound corresponding to the following formula



in which R_1, R_2 and R_3 independently of one another are an optionally halogenated C_1–C_8 alkyl or an optionally halogenated C_6–C_{20} aryl and n and m independently of one another have the value 0 or 1,

F. 0.05 to 1.0 part by weight, based on 100 parts by weight A.+C. and, optionally, B. and/or D., of a tetrafluoroethylene polymer having average particle sizes or 0.05 to 1000 μm and a density of 1.2 to 2.3 g/cm^3 and

G. 0.2 to 5.0 parts by weight, based on 100 parts by weight of the sum of A. to G. of a modified polyalkylene ether which comprises reacting a starting polyalkylene glycol ether with an average molecular weight of 500 to 15,000 with a peroxide or azo radical former in a quantity of 5 to 0.05% by weight based on the quantity of starting polyalkylene glycol ether by stirring the radical former with the starting polyalkylene glycol ether at temperature of 50° to 150° C., until a medium to high viscosity substantially clear liquid or colorless suspension is obtained, wherein the starting polyalkylene glycol is the reaction product of ethylene glycol, 1,2-propylene glycol, trimethylol-propane, glycerol, pentaerythritol, sorbitol or mannitol and alkylene oxide comprising ethylene oxide or propylene oxide.

4,920,167

ANTISTATIC POLYURETHANE-UREA DISPERSIONS

Sven H. Ruetman, Walnut Creek; Joginder N. Anand, Clayton, and G. Robert Collins, Walnut Creek, all of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 10, 1988, Ser. No. 269,506
Int. Cl.[5] C08G *18/06*
U.S. Cl. 524—155 **17 Claims**

1. A dispersion of a polyurethane-urea polymer in a continuous aqueous phase, said dispersion containing about 0.1 to about 5 parts by weight of an alkali metal or alkaline earth metal salt of a thiocyanate ion, fluorinated alkyl sulfonate ion or tetraorganoboron ion per 100 parts by weight of polyurethane-urea polymer.

4,920,168
STABILIZED SILOXANE-CONTAINING MELT-EXTRUDABLE THERMOPLASTIC COMPOSITIONS

Ronald S. Nohr, Roswell, and J. Gavin MacDonald, Decatur, both of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Apr. 14, 1988, Ser. No. 181,352
Int. Cl.[5] C08K 5/54
U.S. Cl. 524—188 30 Claims

1. A stabilized surface-segregatable, melt-extrudable thermoplastic composition which comprises:

(A) at least one thermoplastic polymer;

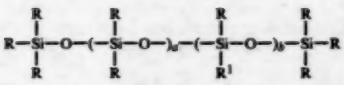
(B) at least one siloxane-containing primary additive having at least two moieties, A and B, in which:

(1) said primary additive is compatible with said polymer at melt extrusion temperatures but is incompatible at temperatures below melt extrusion temperatures, but each of moiety A and moiety B, if present as separate compounds, would be incompatible with said polymer at melt extrusion temperatures and at temperatures below melt extrusion temperatures;

(2) moiety B has at least one functional group which is a poly(oxyalkylene) moiety; and

(3) the molecular weight of said primary additive is in the range of from about 400 to about 15,000;

with the proviso that said primary additive cannot be a compound having the general formula,



in which each R independently is an alkyl group; R^1 is a monovalent inorganic group containing at least one ethyleneoxy group, vicinal epoxy group, or amino group; and a and b, which can be the same or different, each have a value of at least 1; and

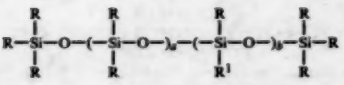
(C) at least one siloxane-containing stabilizing additive having at least two moieties, A′ and B′, in which:

(1) said stabilizing additive is compatible with said polymer at melt extrusion temperatures but is incompatible at temperatures below melt extrusion temperatures, but each of moiety A′ and moiety B′, if present as separate molecular compounds, would be incompatible with said polymer at melt extrusion temperatures and at temperatures below melt extrusion temperatures;

(2) moiety B′ has at least one functional group which is an aliphatic or cycloaliphatic amino group; and

(3) the molecular weight of said stabiilizing additive is in the range of from about 400 to about 15,000;

with the proviso that said stabilizing additive cannot be a compound having the general formula,



in which each R independently is an alkyl group; R^1 is a monovalent organic group containing at least one amino group; and a and b, which can be the same or different, each have a value of at least 1;

in which thermoplastic composition:

(1) said primary additive is present at a level in the range of from about 0.1 to about 50 percent by weight, based on the weight of said polymer; and

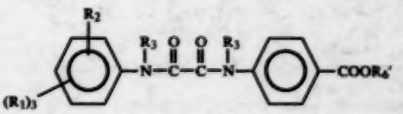
(2) said stabilizing additive is present at a level in the range of from about 0.1 to about 5 percent by weight, based on the weight of said primary additive.

4,920,169
OXALIC ACID DI(PHENYLAMIDES) AND USE THEREOF AS UV ABSORBERS

Lajos Avar, Biel-Benken, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 126,647, Dec. 1, 1987, abandoned. This application May 26, 1989, Ser. No. 357,572
Claims priority, application United Kingdom, Dec. 2, 1986, 862870; Jan. 21, 1987, 8701273
Int. Cl.[5] C08K 5/20
U.S. Cl. 524—219 20 Claims

1. A compound of formula I



(I)

in which

each R_1, independently, is selected from hydrogen, C_{1-12}alkyl, C_{1-12}alkoxy and halogen;

R_2 is C_{1-4}alkoxy;

R_3 is hydrogen or methyl; and

R_6' is unsubstituted C_{6-18}alkyl, uninterrupted or interrupted by one —O— group or C_{1-18}alkyl mono-substituted by OH and uninterrupted or interrupted by 1 or 2 —O— groups.

19. A polymeric material to which a light-stabilizing amount of a compound of formula I defined in claim 1, has been added.

4,920,170
PROCESS FOR PRODUCING FLUORINE-CONTAINING ELASTIC COPOLYMER

Masatoshi Abe; Shin Okamoto, and Akihiro Naraki, all of Kitaibaraki, Japan, assignors to Nippon Mektron Limited, Tokyo, Japan

Filed Jun. 28, 1988, Ser. No. 212,587
Claims priority, application Japan, Jul. 17, 1987, 62-177089
Int. Cl.[5] C08F 16/24
U.S. Cl. 526—247 9 Claims

1. A process for producing a fluorine-containing elastic copolymer comprising (a) 30 to 80% by mole of tetrafluoroethylene (b) 26 to 60% by mole of perfluoro (lower alkyl vinyl ether) and (c) 3 to 50% by mole of a perfluoroether compound represented by the following general formula:

$$CF_2{=}CFOCF_2CFXORf$$

wherein X is a fluorine atom or a trifluoromethyl group and Rf is a perfluoroalkyl group, which comprises copolymerizing the (a) component, the (b) component and the (c) component in the presence of a radical polymerization initiator.

4,920,171
WATER-RESISTANT, WATER-FLUSHABLE PAPER COMPOSITIONS

Alexander E. Hutton, Jr., Peterborough; Richard E. Burke, Amherst, and Stanley P. Wheeler, Jr., Peterborough, all of N.H., assignors to Monadnock Paper Mills, Inc., Bennington, N.H.

Filed Feb. 24, 1987, Ser. No. 17,910
Int. Cl.[5] C08K 3/36
U.S. Cl. 524—446 3 Claims

1. A coating composition for application to a flushable cellulosic based waterleaf sheet and for imparting transitory water repellency to at least one surface of said flushable cellulosic waterleaf sheet when applied on said waterleaf sheet at a coverage of from about three pounds to about 10 pounds of coating for every 3,000 square feet of waterleaf sheet, said coating composition consisting essentially of between 20% by weight

to about 70% by weight of relatively large particle size delaminated clay, with the balance being a polyethylene based resin composition produced by the drying of a colloidal polyethylene in water composition together with said clay; whereby the resultant surface coating provides surface water repellency without impairing the ability of the waterleaf sheet to be disposed of by flushing.

4,920,172

HYDROPHILIC POLYURETHANE EMULSIONS AND MATERIALS PRODUCED THEREFROM

Sami Daoud, Flemington, N.J., assignor to Tyndale Plains-Hunter Ltd., Princeton, N.J.

Filed Jan. 30, 1989, Ser. No. 303,812

Int. Cl.[5] C08L 75/08

U.S. Cl. 524—502 **31 Claims**

1. An aqueous emulsion of a hydrophilic polyurethane produced by the steps of:

a. dissolving a water insoluble hydrophilic polyurethane in a water immiscible, organic solvent having a boiling point below 100° C.;

b. forming a dispersion of the solution from a. in water by adding the solution to water in the presence of a surfactant while maintaining sufficient agitation to effect dispersal of the solution; and

c. evaporating the organic solvent component of the dispersion, thereby forming a solvent-free emulsion of the polyurethane in the aqueous medium.

4,920,173

PUR POWDER PAINTS FOR MATT COATINGS

Rainer Gras, Bochum, Fed. Rep. of Germany, assignor to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Sep. 15, 1988, Ser. No. 244,348

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1987, 3739479

Int. Cl.[5] C08L 75/02

U.S. Cl. 524—590 **23 Claims**

1. A PUR powder paint for matt coatings, comprising:

(i) a partially or completely blocked polyisocyanate-urea adduct obtained from the reaction of a partially blocked polyisocyanate obtained by adding one mole of a blocking agent to from 5 to 20 moles of a polyisocyanate and then reducing the amount of said polyisocyanate to less than 6.5 weight % of said partially blocked polyisocyanate by thin film evaporation, with a polyamine wherein said polyisocyanate-urea adduct contains a total amount of NCO groups of from 8 to 15 weight % and an amount of free NCO groups up to 4 weight %; and

(ii) a hydroxyl group containing polymer with more than two hydroxyl groups per molecule.

4,920,174

IMPACT-RESISTANT POLYESTER MOLDING COMPOUNDS

Wilfried Bartz, Marl, Fed. Rep. of Germany, assignor to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Jun. 17, 1987, Ser. No. 63,057

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1986, 3620432

Int. Cl.[5] C08L 67/02

U.S. Cl. 525—66 **16 Claims**

1. An impact-resistant polyester molding composition, comprising an intimate mixture of

A. 60 to 98% by weight of a polyester having a viscosity number greater than about 80 cm^3/g,

B. from about 2 to 40% by weight of a polyalkenamer having a viscosity number in the range of from about 50 to about 250 cm^3/g, and

C. 0.1 to 5% by weight of an isocyanate having an average of from 1.8 to 4 NCO groups per mole,

said mixture having been treated with from about 0.05 to about 5% by weight, relative to the sum of components A and B, of an organic free-radical former at a temperature sufficient to cause said free-radical former to decompose into free radicals.

4,920,175

MICROPARTICLES HAVING CROSSLINKING REACTION PROMOTOR FUNCTION AND METHOD OF USE

Kazunori Kanda, Yao; Shinichi Ishikura, Tsuzuki; Keizou Ishii, Ashiya, and Akio Kashihara, Hirakata, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 21,000, Mar. 2, 1987, Pat. No. 4,777,213, which is a continuation of Ser. No. 745,983, Jun. 18, 1985, abandoned. This application Jul. 28, 1988, Ser. No. 225,119

Claims priority, application Japan, Jun. 18, 1984, 59-126225

Int. Cl.[5] C08L 63/00

U.S. Cl. 525—110 **6 Claims**

1. A coating system comprising a film-forming polymer capable of curing through a self-crosslinking reaction or a crosslinking reaction with a separate crosslinker and a catalytic amount of an agent for promoting the crosslinking reaction, wherein said agent is bound to polymer microparticles having a diameter of 0.01 to 6 microns present in said system, said polymer microparticles being prepared by polymerizing a mixture of ethylenically unsaturated monomers, said agent being an $—SO_3H$ or $—PO_4H_2$ group bearing proton donor having a pKa less than 3.0, said coating system containing an aminoplast resin, or a combination of an aminoplast resin with a hydroxy group, carboxyl group or mixture thereof containing alkyd or acrylic resin or a combination of an epoxy resin with a hardener having amino, carboxyl or hydroxyl groups.

4,920,176

NITRILE EMULSION POLYMERS HAVING IMPROVED ADHESION PROPERTIES

August H. Jorgensen, Jr., Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Dec. 5, 1988, Ser. No. 279,680

Int. Cl.[5] C08L 91/02

U.S. Cl. 525—185 **5 Claims**

1. A dried nitrile rubber composition, comprising:

a nitrile rubber composition, said nitrile rubber composition containing a reacted anionic emulsifying aid dispersed therein, said anionic emulsifying aid having been reacted with a cationic polymeric coagulant, said cationic polymeric coagulant being a quaternized poly (alkylene polyamine), a quaternized poly(hydroxyalkylene polyamine), a quaternized poly(carbonylalkylene polyamine, or a quaternized polymer made from epichlorohydrin and a dialkylamine having from 1 to 5 carbon atoms, and wherein the amount of said cationic polymeric coagulant is from about 0.75 weight equivalents to about 1.5 weight equivalents for every weight equivalent of said emulsifying aid.

4,920,177

ACCELERATED CURE OF THERMOPLASTIC COMPOSITIONS

Daniel E. George, Chadds Ford, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 20, 1989, Ser. No. 368,690

Int. Cl.[5] C08L 23/26, 23/04, 23/10; C08J 3/24

U.S. Cl. 525—195 **13 Claims**

1. A process for accelerating the cure rate of a thermoplastic composition comprising blending 5–95 parts by weight of a crystalline polyolefin resin of a substantially saturated homopolymer or copolymer of a C_2–C_8 alpha monoolefin and 5–95 parts by weight of a crosslinkable ethylene-containing terpolymer comprising ethylene, an alkyl acrylate or alkyl methacrylate wherein the alkyl group contains 1–6 carbon atoms or a vinyl ester of a monocarboxylic acid having 2–6 carbon atoms,

and glycidyl acrylate or glycidyl methacrylate, and mixing and shearing the composition while crosslinking the ethylene-containing terpolymer with a crosslinking agent that is a combination of (a) from about 1.5–9 parts by weight per 100 parts ethylene-containing terpolymer of an organic aliphatic or aromatic polycarboxylic acid or anhydride thereof containing 3–18 carbon atoms and (b) from about 0.3–8 parts by weight per 100 parts ethylene-containing terpolymer of a divalent tin halide salt or a stannous acylate having the formula

where R is an aliphatic hydrocarbyl radical having from 1–18 carbon atoms.

4,920,178

SEEDED EMULSION POLYMERIZATION OF α-METHYLSTYRENE AND ACRYLONITRILE

Karl Zabrocki, Buettgen; Christian Lindner, Cologne; Otto Koch, Cologne, and Hans-Eberhard Braese, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 21, 1989, Ser. No. 312,725

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1988, 3807233

Int. Cl.[5] C08F 2/26

U.S. Cl. 525—262 **4 Claims**

1. A process for the production of copolymer which comprises the polymerisation of from 30 to 32 parts by weight, of acrylonitrile and from 68 to 70 parts, by weight, of α-methylstyrene, the monomers being introduced into a seed latex comprising an (α-methyl)-styrene/acrylonitrile copolymer and the polymerization being effected in the presence of a radical water-soluble initiator and a carboxyl group-containing emulsifier at a temperature of from 75° to 82° C., such that the molar ratio of emulsifier:initiator is from 4:1 to 6:1.

4,920,179

SULFONOMALEATION OF ORGANIC MOLECULES AND POLYMERS

Warren A. Thaler, Flemington; Stanley J. Brois, Westfield, both of N.J., and Henry K. Hall, Tucson, Ariz., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 911,761, Sep. 26, 1986, Pat. No. 4,737,303, which is a continuation-in-part of Ser. No. 809,030, Dec. 16, 1985, Pat. No. 4,652,600, which is a continuation-in-part of Ser. No. 778,269, Sep. 20, 1985, Pat. No. 4,587,304. This application Mar. 28, 1988, Ser. No. 174,380

The portion of the term of this patent subsequent to May 6, 2003, has been disclaimed.

Int. Cl.[5] C08F 267/04

U.S. Cl. 525—285 **1 Claim**

1. A sulfone adduct which comprises the reaction product of:

and an unsaturated hydrocarbon polymer wherein X is an alkyl group selected from the group consisting of C_nH_{2n+1}, wherein n=1 to 18; X is an aryl group consisting of C_mH_{m-1} wherein m=6 and $C_mH_{m-2}Z$ wherein m=6 and Z is selected from the group consisting of OR', R'', COOR''', NO_2, Cl, Br, F and I where R', R'' and R''' having about 1 to about 18 carbon atoms; wherein said unsaturated hydrocarbon polymer is selected from the group consisting of ethylene propylene terpolymers, ethylene diene copolymers, propylene diene copolymers, polyisoprene, Butyl rubber, polybutadiene and styrenebutadiene, and styrene-isoprene random and block copolymers, polypropylenes and polyisobutylenes.

4,920,180

HIGHLY WATER-ABSORPTIVE OCULAR LENS MATERIAL

Nobuyuki Toyoshima; Takanori Shibata, and Atsushi Hirashima, all of Nagoya, Japan, assignors to Menicon Co., Ltd., Nagoya, Japan

Filed Mar. 8, 1989, Ser. No. 320,598

Claims priority, application Japan, Mar. 9, 1988, 62-55708; Dec. 10, 1988, 62-312719

Int. Cl.[5] C08F 216/12, 16/12

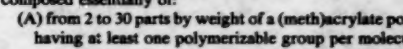
U.S. Cl. 525—328.9 **12 Claims**

1. A highly water absorptive ocular lens material obtained by saponification for hydrophilic treatment of a copolymer composed essentially of:

(A) from 2 to 30 parts by weight of a (meth)acrylate polymer having at least one polymerizable group per molecule on an average obtained by copolymerizing (a) an alkyl (meth-)acrylate monomer and (b) a monomer having at least two polymerizable groups per molecule, as the main components;

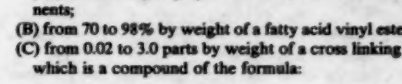
(B) from 70 to 98% by weight of a fatty acid vinyl ester; and

(C) from 0.02 to 3.0 parts by weight of a cross linking agent which is a compound of the formula:



(II)

wherein each of R_6 and R_7 which may be the same or different, is $-CH=CH_2$ or $-CH_2-CH=CH_2$, and each of a and b is an integer of from 0 to 5, provided that when a is 0, b is 0; or the formula:



(III)

wherein R_6 and R_7 are as defined above, R_8 is $-CH=CH_2$ or $-CH_2-CH=CH_2$, each of R_9 and R_{10} which may be the same or different, is a hydrogen atom, $-CH_3$, $(CH_2)_g-OH$ wherein g is an integer of from 1 to 5, $(CH_2CH_2O)_h R_{11}$ wherein R_{11} is a hydrogen atom or $-CH_3$, and h is an integer of from 0 to 12, or $-COOR_{11}$ wherein R_{11} is as defined above, c is an integer of from 0 to 3, is an integer of from 0 to 500, e is an integer of from 1 to 10,000, and f is an integer of from 0 to 3,

provided that the total amount of polymer (A) and monomer (B) is 100 parts by weight.

4,920,181

POLYMERIC EMULSIFIERS BASED ON AMINO TELECHELATIC VINYL OLIGOMERS II

Adolf Schmidt, Cologne; Udo Hendricks, Odenthal; Bruno Bömer, Bergisch Gladbach; Karl-Heinz Ott, Leverkusen; Herbert Eichenauer, Dormagen, and Alfred Pischtschan, Kuerten, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 16, 1987, Ser. No. 133,551

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1986, 3643818

Int. Cl.[5] C08F 8/34

U.S. Cl. 525—327.5 **8 Claims**

1. Sulphosuccinamide acids and their salts corresponding to the formula

$$X-(NHOC-\underset{R^1}{CH}-\underset{R^2}{CH}-COOM)_n$$

wherein

X denotes the residue of a hydrophobic vinyloligomer having an average molecular weight $\overline{M}_n$ of from 200–5,000, one of R^1 and R^2 is hydrogen and the other is $-SO_3M$, n represents a number with a value of from 1.4–3.0, and M denotes hydrogen, an alkali metal, ammonium, C_1–C_4-alkylammonium, or C_2–C_3-hydroxy alkyl-ammonium.

4,920,182

EPOXY RESIN COMPOSITIONS CONTAINING POLYESTER FLEXIBILIZER AND METALLOCENE COMPLEX INITIATOR

Aloysius H. Manser, Allschwil, Switzerland; Dieter Strasilla, Weil am Rhein, Fed. Rep. of Germany, and Rolf Mülhaupt, Marly, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 5, 1988, Ser. No. 279,884

Claims priority, application Switzerland, Dec. 18, 1987, 4957/87

Int. Cl.[5] C08L *63/02*

U.S. Cl. 525—438 **8 Claims**

1. A composition containing

(A) An epoxy resin having on average at least two 1,2-epoxy groups per molecule or a mixture of these epoxy resins,

(B) a compound of formula I or a mixture of these compounds

$$[R^1(Fe^{II}R^2)_a]^{+ab}[X]^- \qquad (I)$$

in which a and b independently of one another are 1 or 2, R^1 is a pi-arene, R^2 is a pi-arene or a cyclopentadienyl anion, X^- is $[LQm]^-$ or an anion of a partially fluorinated or perfluorinated aliphatic or aromatic sulfonic acid, L is B, P, As or Sb, Q is fluorine or fluorine in combination with hydroxyl groups, and m corresponds to the valence of L increased by one, and

(C) a flexible polyester which is terminated by, on average, at least two carboxyl groups and which is derived from an aliphatic or cycloaliphatic polyol or a mixture of such polyols and from an aliphatic, cycloaliphatic or aromatic polycarboxylic acid or a mixture of such polycarboxylic acids.

4,920,183

METHOD FOR MAKING SILICONE-POLY(ARYLCARBONATE) BLOCK COPOLYMERS

Thomas L. Evans, Clifton Park, and John C. Carpenter, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 158,411, Feb. 22, 1988. This application Feb. 8, 1989, Ser. No. 307,707

Int. Cl.[5] C08F *283/02*

U.S. Cl. 525—464 **9 Claims**

1. A method for making silicone-poly(arylcarbonate) block copolymers which comprises

(1) polymerizing a cyclic aryl carbonate in the presence of a phenol or bisphenol-A- to provide a hydroxylaryl terminated polyarylcarbonate oligomer having an average of about 2 to 1000 chemically combined arylcarbonate units,

(2) intercondensing the hydroxylaryl terminated polycarbonate oligomer and chlorine terminated polydiorganosiloxane having an average of about 2 to 1000 chemically combined units in the presence of an organic solvent and an acid acceptor, and

(3) recovering silicone-poly(arylcarbonate) block copolymer from the mixture of (2).

4,920,184

HYDROPHILIC SILICONE RUBBER ARTICLE AND PROCESS FOR ITS PREPARATION

Horst Schäfer, Aschaffenburg; Gerhard Kossmehl, Berlin, and Walter Neumann, Königsbronn, all of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 133,236, Dec. 16, 1987, abandoned, which is a continuation of Ser. No. 863,139, May 14, 1986, abandoned. This application Aug. 5, 1988, Ser. No. 228,867

Claims priority, application Fed. Rep. of Germany, May 15, 1985, 3517615

Int. Cl.[5] C08L *43/04*

U.S. Cl. 525—477 **12 Claims**

1. An improved process for hydrophilizing the surface of a molded silicone rubber article in which the silicone rubber at its surface is reacted in a catalyzed equilibration reaction with an organosiloxane, wherein the improvement comprises

using as the organosiloxane a preformed organosiloxane containing hydroxyalkyl or protected hydroxyalkyl moieties, synthesized by reacting a siloxane containing a Si—H group with an allyloxy compound in the presence of a catalyst.

4,920,185

COLOR DEVELOPER FOR PRESSURE-SENSITIVE RECORDING PAPER AND PRODUCTION THEREOF USING A PHENOL-XYLENE-FORMALDEHYDE RESIN

Yukio Tokunaga, and Yukio Saeki, both of Fujieda, Japan, assignors to Sumitomo Durez Company, Ltd., Tokyo, Japan

Filed Jan. 27, 1989, Ser. No. 302,242

Claims priority, application Japan, Jan. 29, 1988, 63-16841

Int. Cl.[5] C08G *8/28, 8/32*

U.S. Cl. 525—506 **9 Claims**

1. A color developer for pressure sensitive recording paper comprising a polyvalent metal-bound carboxyl-modified p-subsituted phenol-xylene-formaldehyde co-condensate containing a carboxyl group, wherein the co-condensate is formed by condensing p-substituted phenol and a xylene-formaldehyde resin in the ratio 10–100 parts p-substituted phenol to 100 parts xylene-formaldehyde resin, adding a carboxyl group to said co-condensate and bonding with the polyvalent metal.

4,920,186

COLOR DEVELOPER FOR PRESSURE SENSITIVE RECORDING PAPER AND PRODUCTION THEREOF USING PHENOL-MESITYLENE-FORMALDEHYDE RESIN

Yukio Tokunaga, and Yukio Saeki, both of Fujieda, Japan, assignors to Sumitomo Durez Company, Ltd., Tokyo, Japan

Filed Jan. 12, 1989, Ser. No. 296,091

Int. Cl.[5] C08G *8/28, 8/32*

U.S. Cl. 525—506 **7 Claims**

1. A color developer for pressure sensitive recording paper comprising a polyvalent metal-bound carboxyl-modified p-alkylphenol-mesitylene-formaldehyde co-condensate containing a carboxyl group, wherein the co-condensate is formed by condensing p-alkylphenol and a mesitylene-formaldehyde resin in the ratio 10–100 parts p-alkylphenol to 100 parts mesitylene-formaldehyde resin and wherein the p-alkylphenol contains an alkyl group of 1 to 12 carbon atoms.

4,920,187

PROCESS FOR PREPARING PARTICLES HAVING MONODISPERSE PARTICLE SIZE

Akio Kashihara, Hirakata; Chikayuki Otsuka, Kadoma, and Katsukiyo Ishikawa, Kuze, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Jan. 4, 1988, Ser. No. 140,663

Claims priority, application Japan, Jan. 12, 1987, 62-5283; Jan. 12, 1987, 62-5284; Oct. 30, 1987, 62-277067

Int. Cl.[3] C08F 2/00

U.S. Cl. 526—193 **19 Claims**

1. A process for preparing polymer particles having a narrow particle size distribution range comprising:

adding a dispersion stabilizer, a polymerizable monomer and a polymerization initiator to an organic solvent to conduct polymerization such as to produce polymer particles dispersed in the organic solvent, wherein said organic solvent has a solubility parameter (SP value) higher than that of the resultant polymer by at least 1.0 and wherein said dispersion stabilizer is soluble in said organic solvent and has a free radical reactive group at a concentration within the range of 10^{-3} to 1 mmol/g based on the dispersant solid contents and which dispersion stabilizer functions by producing a stable dispersion of the polymer in said organic solvent said free radical reactive groups including a polymerizable double bond or a thiol group, which free radical groups react with said polymerizable monomer such as to chemicallv bond the dispersion stabilizer onto the polymer particles thus-produced; and

removing said organic solvent to produce the polymer particles.

4,920,188

CURABLE COMPOSITIONS

Takeshi Sakashita, Iwakuni; Narimichi Honda, Yamaguchi, and Masami Arata, Iwakuni, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

PCT No. PCT/JP88/00661, § 371 Date Mar. 3, 1989, § 102(e) Date Mar. 3, 1989, PCT Pub. No. WO89/00170, PCT Pub. Date Jan. 12, 1989

PCT Filed Jul. 1, 1988, Ser. No. 334,105

Claims priority, application Japan, Jul. 3, 1987, 62-166736

Int. Cl.[5] C08F 4/52

U.S. Cl. 526—196 **2 Claims**

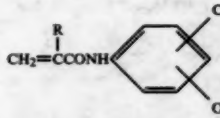
1. A curable composition comprising,

(A) a monofunctional (meth)acrylate monomer,

(B) a polyfunctional (meth)acrylate monomer,

(C) a (meth)acrylate monomer containing an acidic group and at least one (meth)acryloyloxyl group in its molecule,

(D) a monofunctional (meth)acrylamide monomer of the general formula (I):



(I)

wherein R is H or CH_3, and

(E) a trialkylboron and/or a partial oxide thereof.

4,920,189

PROCESS FOR THE PRODUCTION OF TOLUENE-SOLUBLE, SULPHUR-MODIFIED CHLOROPRENE POLYMERS

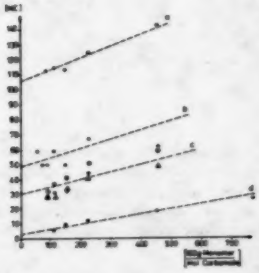
Werner Obrecht, Moers; Peter Wendling; Wilhelm Göbel, both of Leverkusen, and Eberhard Müller, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 831,866, Feb. 24, 1986, abandoned. This application Aug. 25, 1987, Ser. No. 89,934

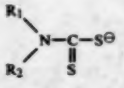
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1985, 3507825

Int. Cl.[5] C08F 2/26

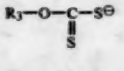
U.S. Cl. 526—204 **7 Claims**



1. A process for the production of toluene-soluble, sulphur-modified polychloroprene by emulsion polymerization of chloroprene, 0.05 to 1% by weight sulphur and up to 20% by weight of further monomers which are copolymerizable with chloroprene and sulphur selected from the group consisting of 2,3-dichlorobutadiene, 1-chlorobutadiene, butadiene, isoprene, acrylic acid, methacrylic acid, acrylonitrile and methacylonitrile, using a peroxy activator and subsequent working-up by stabilizing, stopping, degassing and isolating without separate peptization, characterised in that polymerization is carried out in the presence of dithiocarbamates or xanthogenates and the activator is metered in continuously or batch-wise during the course of polymerization, wherein said dithiocarbamates have an anion of the formula



and the xanthogenates have an anion of the formula



wherein R_1, R_2 and R_3 are each independent of one another unsubstituted or substituted alkyl. cycloalkyl or aryl, or R_1 and R_2 together form a ring structure with the nitrogen atom to which they are bonded.

4,920,190

FLUORINATED CARBAMATE POLYMERS AS HYDROPHOBIC AND OLEOPHOBIC AGENTS

Marie-Jose Lina, Tassin La Demi Lune, and Andre Dessaint, Clermont, both of France, assignors to Atochem, Puteaux, France

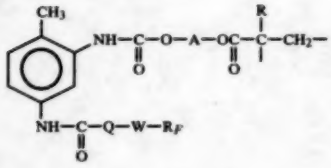
Division of Ser. No. 932,807, Nov. 19, 1986. This application Jun. 21, 1988, Ser. No. 209,388

Claims priority, application France, Dec. 3, 1985, 85 17882

Int. Cl.[5] C07C *155/02, 125/06;* C08F *12/30, 26/02*

U.S. Cl. 526—288 11 Claims

1. Fluorinated acrylic polymers comprising repeating units of the general formula:



(VIII)

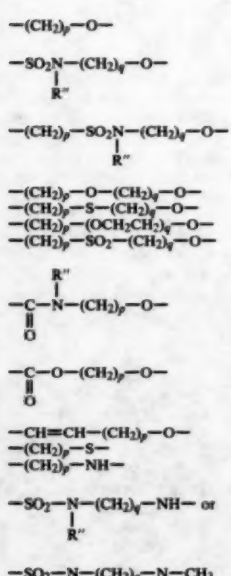
in which

R_F denotes a perfluoroalkyl radical having a straight or branched chain and containing from 2 to 20 carbon atoms,

R denotes hydrogen or a methyl radical,

A denotes a divalent linkage which has 2 to 9 carbon atoms and can contain one oxygen atoms or two uncontiguous oxygen atoms, and

—W—Q— is:



in which R″ is hydrogen or a methyl radical and the symbols p and q, which may be identical or different, each denote an integer ranging from 1 to 20.

4,920,191

LIQUID CRYSTALLINE POLYESTER SILOXANES

Matthew E. Langer, Guilderland; Peter P. Policastro, Niskayuna, and Allan R. Shultz, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 6, 1989, Ser. No. 319,028

Int. Cl.[5] G08G *77/04*

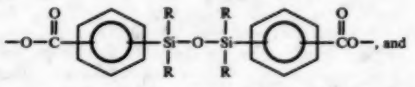
U.S. Cl. 528—26 5 Claims

1. Liquid crystalline polyester-siloxanes selected from the class consisting of

(1) a composition comprising

(A) 20 to 90 mole percent of hydroxybenzoic acid units,

(B) 5 to 50 mole percent of tetraorganodisiloxanebisbenzoic acid units of the formula



, and

(C) 0 to 50 mole percent of terephthalic acid units, condensed with

(D) 5 to 50 mole percent of biphenol units and

(2) a composition comprising (A) and (B) condensed with a member selected from the class consisting of

(E) 5 to 50 mole percent of hydroquinone units, and

(F) 5 to 50 mole percent of diphenyletherbishydroxy units,

where the mole percents of the individual condensed units of the respective liquid crystalline polyester-siloxanes ABCD, ABD, ABE and ABF are based on the total moles of the condensed units in the respective liquid crystalline polyester-siloxanes of (1) and (2) and R is a member selected from the class consisting of the same or different $C_{(1-13)}$ monovalent hydrocarbon radicals and $C_{(1-13)}$ monovalent hydrocarbon radicals substituted with radicals inert during condensation.

4,920,192

POLYURETHANE QUASI PREPOLYMER FOR PROPPANT CONSOLIDATION

Robin Wiser-Hailaday, McKinney, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jan. 31, 1989, Ser. No. 304,325

Int. Cl.[5] C08G *18/75*

U.S. Cl. 528—48 11 Claims

1. A method for forming a quasi prepolymer containing polyurethane linkages comprising:

a. forming said quasi prepolymer by reacting in intimate admixture a diol and in stoichiometric excess methylene diphenylene diisocyanate, all in the presence of a diluent; and

b. allowing the reactants to stand in intimate admixture for a time sufficient to form oligmers containing polyurethane linkages.

4,920,193

MEMBRANES

Richard A. Hann; David R. Holmes, both of Frodsham, and John W. Smith, Liverpool, all of England, assignors to Imperial Chemical Industries PLC, London, United Kingdom

Division of Ser. No. 865,831, May 22, 1986, abandoned. This application Jul. 19, 1988, Ser. No. 221,434

Claims priority, application United Kingdom, May 23, 1985, 8513114

Int. Cl.[5] C08J *3/08;* C08L *81/06*

U.S. Cl. 528—171 8 Claims

1. A sulphonated polyarylethersulphone containing repeat units of the formula:

$$—Ph^1—O—Ph^3—O—Ph^1—SO_2— \quad (V)$$

together with repeat units of the formula:

$$—Ph^1—O—Ph^1—SO_2— \quad \text{(III)}$$

wherein

Ph^1 is a phenylene residue;

Ph^3 is a phenylene residue having one or two groups $—SO_3M^1$, wherein in some $—SO_3M^1$ groups M^1 is hydrogen and in other $—SO_3M^1$ groups M^1 is barium the proportion of the groups $—SO_3M^1$ in which M^1 is barium being at least 85% and not more than 91% of the total of the $—SO_3M^1$ groups.

4,920,194

BLOOD SUBSTITUTE

Wolfgang Feller, Ernstbergstrasse 30; Norbert Macht, Hessenwinkel 26, both of Meisungen, and Johannes G. Böttrich, Talstrassse 6, Kirtorf-Lehrbach, all of Fed. Rep. of Germany

Filed Oct. 19, 1987, Ser. No. 110,013

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1986, 3636590

Int. Cl.[5] C07K *15/22*; A61K *37/14*

U.S. Cl. 530—385 **18 Claims**

1. A stroma-free blood substitute consisting essentially of an aqueous medium containing the covalently linked adducts of sulfated glycosaminoglycan fragments having molecular weights from 1000 to 10,000 daltons with hemoglobin, the proportion of said fragments and of said hemoglobin being such that the oxygen binding property of said adducts is from 4.79 kPa to 9.33 kPa partial pressure of oxygen.

4,920,195

FLUORESCENT LANTHANIDE CHELATES

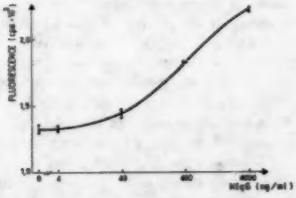
Jouko Kankare, Paljaspää 8E3, SF-206 10 Turku 61; Harri Takalo, Ursininkatu 13A4, SF-20100 Turku 10, and Paavo Pasanen, Menninkaisenkatu 10E37, SF-20640 Ravattula, all of Finland

Continuation-in-part of Ser. No. 863,047, May 14, 1986, abandoned. This application Jan. 25, 1988, Ser. No. 149,980

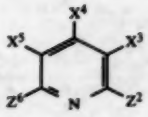
Claims priority, application Sweden, May 23, 1985, 8502573

Int. Cl.[5] C07F *5/00*; G01N *33/533*; C07D *213/38, 213/55*

U.S. Cl. 534—16 **12 Claims**



1. A fluorescing lanthanide chelate of a lanthanide cation and a compound having the structure:



wherein each of X^3, X^4 and X^5, that can be the same or different, denotes a substituted ethynyl group directly attached to the pyridine ring, a hydrogen, an alkyl group, an aryl group, a hydroxyl group, an alkoxyl group or an amino group, wherein at least one of X^3, X^4 and X^5 denotes the substituted ethynyl group, and each of Z^2 and Z^6, that can be the same or different, denotes a chelating group that together with the pyridine nitrogen chelates the lanthanide cation.

4,920,196

HUMAN LYMPHOTOXIN

Bharat B. Aggarwal, San Mateo, Calif., assignor to Genentech, Inc., South San Francisco, Calif.

Continuation of Ser. No. 608,316, May 7, 1984, abandoned, which is a continuation-in-part of Ser. No. 403,671, Jul. 30, 1982, abandoned. This application Feb. 6, 1987, Ser. No. 11,448

Int. Cl.[5] C07G *7/00*; A61K *45/05*; C12N *5/00*

U.S. Cl. 530—351 **28 Claims**

1. A composition suitable for administration as an anti-tumor agent comprising a substantially homogeneous lymphotoxin having a molecular weight by SDS-PAGE of about 25,000 daltons and the amino acid sequence

NH_2—Leu Pro Gly Val Gly Leu Thr Pro Ser Ala Ala—
Gln Thr Ala Arg Gln His Pro Lys Met His Leu Ala—
His Ser Thr Leu Lys Pro Ala Ala His Leu Ile Gly—
Asp Pro Ser Lys Gln Asn Ser Leu Leu Trp Arg—
Ala Asn Thr Asp Arg Ala Phe Leu Gln Asp Gly—
Phe Ser Leu Ser Asn Asn Ser Leu Leu Val Pro—
Thr Ser Gly Ile Tyr Phe Val Tyr Ser Gln Val—
Val Phe Ser Gly Lys Ala Tyr Ser Pro Lys Ala—
Thr Ser Ser Pro Leu Tyr Leu Ala His Glu Val—
Gln Leu Phe Ser Ser Gln Tyr Pro Phe His Val—
Pro Leu Leu Ser Ser Gln Lys Met Val Tyr Pro—
Gly Leu Gln Glu Pro Trp Leu His Ser Met Tyr—
His Gly Ala Ala Phe Gln Leu Thr Gln Gly Asp—
Gln Leu Ser Thr His Thr Asp Gly Ile Pro His—
Leu Val Leu Ser Pro Ser Thr Val Phe Phe Gly—
Ala Phe Ala Leu,

to pharmaceutically acceptable derivates prepared from the functional groups on the side chains of amino acids, or the N- or C- terminal groups; to enzymatic or chemically hydrolyzed fragments; to aggregates which are the result of lymphotoxin trimers; or to pharmaceutically acceptable salts, wherein such derivatives, fragments, aggregates and salts maintain the biological activity of mature lymphotoxin and which do not confer toxic properties to the composition; said lymphotoxin having a specific activity of greater than about 10×10^6 units/mg of protein.

14. A process for preparing human lymphotoxin having a molecular weight by SDS-PAGE of about 25,000 daltons and the amino acid sequence

NH_2—Leu Pro Gly Val Gly Leu Thr Pro Ser Ala Ala—
Gln Thr Ala Arg Gln His Pro Lys Met His Leu Ala—
His Ser Thr Leu Lys Pro Ala Ala His Leu Ile Gly—
Asp Pro Ser Lys Gln Asn Ser Leu Leu Trp Arg—
Ala Asn Thr Asp Arg Ala Phe Leu Gln Asp Gly
Phe Ser Leu Ser Asn Asn Ser Leu Leu Val Pro—
Thr Ser Gly Ile Tyr Phe Val Tyr Ser Gln Val—
Val Phe Ser Gly Lys Ala Tyr Ser Pro Lys Ala—
Thr Ser Ser Pro Leu Tyr Leu Ala His Glu Val—
Gln Leu Phe Ser Ser Gln Tyr Pro Phe His Val—
Pro Leu Leu Ser Ser Gln Lys Met Val Tyr Pro—
Gly Leu Gln Glu Pro Trp Leu His Ser Met Tyr—
His Gly Ala Ala Phe Gln Leu Thr Gln Gly Asp—
Gln Leu Ser Thr His Thr Asp Gly Ile Pro His—
Leu Val Leu Ser Pro Ser Thr Val Phe Phe Gly—
Ala Phe Ala Leu,

and fragments thereof, which process comprises

(a) obtaining an extract, supernatant or filtrate from a cell culture which produces lymphotoxin;

(b) treating said extract, supernatant, or filtrate with a lentil lectin adsorbent; and

(c) selectively eluting the lymphotoxin from the adsorbent.

4,920,197

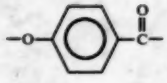
POLYESTER RESIN EXHIBITING OPTICAL ANISOTROPY IN MOLTEN STATE WHICH CONTAINS A LOW CONCENTRATION OF 6-OXY-2-NAPHTHOYL UNITS AND COMPOSITION THEREOF

Noriyuki Hayashi, Fuji, and Kenji Hijikata, Mishima, both of Japan, assignors to Polyplastics Co., Ltd., Japan

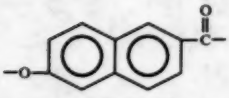
Filed Apr. 10, 1989, Ser. No. 335,504
Claims priority, application Japan, Apr. 13, 1988, 63-90891
Int. Cl.[5] C08G 63/02
U.S. Cl. 528—190 **6 Claims**

1. A polyester resin which comprises 35 to 90 mole percent of the unti (I), 0.5 to 4 mole percent of the unit (II), 0.5 to 30 mole percent of the unit (III), and 0.5 to 30 mole percent of the unit (IV), exhibiting the anisotropy in its molten state.

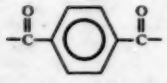
(I)



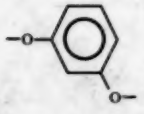
(II)



(III)



(IV)



4,920,198

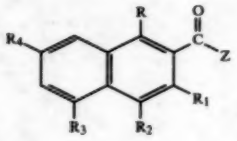
BRANCHED POLYCARBONATE FROM HYDROXY-NAPHTHOIC ACID OR DERIVATIVE, AND PROCESS FOR PREPARING

Alberto Petri, Milan, Italy, assignor to Enichem Tecnoresine S.p.A., Palermo, Italy

Filed Jun. 7, 1988, Ser. No. 203,425
Claims priority, application Italy, Jun. 17, 1987, 20929 A/87
Int. Cl.[5] C08G 63/62
U.S. Cl. 528—201 **4 Claims**

1. A blow moldable branched polycarbonate comprising units derived from phosgene, at least one aromatic dihydroxy-compound and a hydroxy-naphthoic acid compound having the formula:

(I)



wherein:

Z represents OH or Cl;

R, R_1, R_2, R_3, and R_4, are the same or different from one another, and represent H, OH, alkyl groups containing from 1 to 4 carbon atoms, and at least two thereof are OH.

4,920,199

WATER-REDUCIBLE COATING COMPOSITION

Richard E. Jarzombek, Munster; Raymond J. Moeller, Jr., Cedar Lake, both of Ind., and Merrill L. Pruitt, Lansing, Ill., assignors to Bee Chemical Company, Lansing, Ill.

Filed Nov. 10, 1988, Ser. No. 269,824
Int. Cl.[5] C08G 63/02
U.S. Cl. 528—272 **24 Claims**

1. A clear, homogeneous coating binder solution comprising:

I. an organic component binder mixture comprising

(A) between about 25 and about 95 wt. percent of a polymer which is a polyether or has both ether and ester linkages, said polymer having an acid number below about 15 and an hydroxyl value in the range of between about 100 to about 1000,

(B) between about 2.5 and about 50 wt. percent of an amine-formaldehyde resin, and

(C) up to about 50 wt. percent of an organic solvent;

said components (A), (B), and (C) being mutually compatible so as to form a clear, homogeneous organic component binder mixture in the absence of water; said organic component binder mixture being sufficiently compatible with a volume of water equal to at least about one fifth the total volume of said organic component binder mixture and with sufficient additional water to achieve a thinned viscosity of less than about 250 cps so as to remain a clear homogeneous solution, plus

II. a volume of water equal to at least about one fifth the volume of said organic component binder mixture plus sufficient additional water to achieve a thinned viscosity of less than about 250 cps.

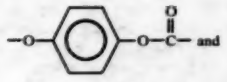
4,920,200

HYDROQUINONE-BISPHENOL CYCLIC COPOLYCARBONATE OLIGOMER

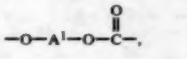
Daniel J. Brunelle, Scotia, and David K. Bonauto, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 27, 1988, Ser. No. 290,053
Int. Cl.[5] C08G 63/62
U.S. Cl. 528—370 6 Claims

1. A composition consisting essentially of cyclic copolycarbonate oligomers having structural units of the formulas

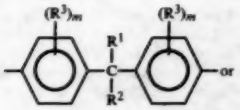


(I)

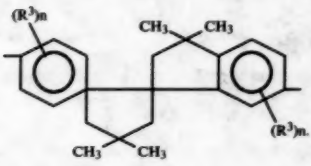


(II)

wherein A^1 is



(III)



(IV)

each of R^1 and R^2 is a c_{1-4} primary or secondary alkyl or C_{6-10} aromatic hydrocarbon radical, R^3 is C_{1-4} primary or secondary alkyl or halo, m is 0–4 and n is 0–3; at least 40% of the structural units in said oligomers having formula I.

4,920,201

ISOLATION OF PURIFIED SOLID POLYARYLENE SULFIDE DIRECTLY FROM POLYMERIZATION SOLUTION

Wolfgang Jakob, Moers; Erhard Tresper, and Wolfgang Alewelt, both of Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 18, 1988, Ser. No. 233,669
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1987, 3728703
Int. Cl.[5] C08G 75/02; C08J 11/04
U.S. Cl. 528—486 4 Claims

1. Process for the isolation of purified polyarylenesulphide as a solid polymer phase directly from a polymerization solution, the process characterized in that after termination of polymerization, salts of carboxylic acids are added to the polymerization solution with or without cooling or stirring and the resulting suspension is filtered at elevated temperatures to isolate the purified solid polymer from the polymerization solution.

4,920,202

METHOD FOR PRODUCTION OF HYDROPHILIC POLYMER FROM HYDRATED GEL POLYMER

Yoshio Irie; Kaoru Iwasaki; Takumi Hatsuda, all of Himeji; Kazumasa Kimura, Osaka; Nobuyuki Harada; Kunihiko Ishizaki, both of Suita; Tadao Shimomura, Toyonaka, and Teruaki Fujiwara, Himeji, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Filed Apr. 29, 1988, Ser. No. 187,866
Claims priority, application Japan, Apr. 30, 1987, 62-104764
Int. Cl.[5] C08F 6/00
U.S. Cl. 528—500 17 Claims

1. A method for the production of a hydrophilic polymer having a small residual monomer content from a hydrated gel polymer, which method comprises drying said hydrated gel polymer by contact thereof with a gas containing at least steam and having a dew point in the range of 50° to 100° C. at a temperature in the range of 80° C. to 250° C.

4,920,203

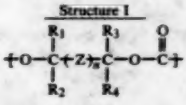
MEDICAL DEVICES FABRICATED FROM HOMOPOLYMERS AND COPOLYMERS HAVING RECURRING CARBONATE UNITS

Reginald T. Tang, Warren; Frank Mares, Whippany; William J. Boyle, Jr., Parsippany; Tin-Ho Chiu, Millburn, and Kundabhai M. Patel, Landing, all of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

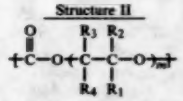
Continuation-in-part of Ser. No. 134,290, Dec. 17, 1987, and a continuation-in-part of Ser. No. 134,321, Dec. 17, 1987, Pat. No. 4,891,263, and a continuation-in-part of Ser. No. 134,339, Dec. 17, 1987. This application Aug. 2, 1988, Ser. No. 227,386
Int. Cl.[5] C08L 71/02
U.S. Cl. 525—409 38 Claims

1. A medical device formed totally or in part of one or more biopolymers selected from the group consisting of block copolymers having at least one type of recurring monomeric unit of the following General Structures I and II:

Structure I



Structure II



wherein:

Z is —C(R_5R_6)—, —NR_5—, —O— or a combination thereof, where Z is selected such that there are no adjacent heteroatoms;

n is from 1 to about 8;

m is from 1 to about 8;

R_1, R_2, R_3, and R_4 are the same or different at each occurrence and are hydrogen, aryloxyalkyl, alkyoxyaryl, aryloxyaryl, arylalkyl, alkylarylalkyl, arylalkylaryl, alkylaryl, arylcarbonylalkyl, alkyl, aryl, alkylcarbonyalkyl, cycloalkyl, arylcarbonylaryl, alkylcarbonylarly, alkoxyalkyl, or aryl or alkyl substituted with one or more substituents selected from the group consisting of alkyl, aryl, alkoxy, aryloxy, dialkylamino, diarylamino, and alkylarylamino; and

R_5 and R_6 are the same or different and are R_1, R_2, R_3, R_4, dialkylamino, diarylamino, alkylarylamino, alkoxy, aryloxy, alkanoyl, or arylcarbonyl, or any two of R_1 to R_6 together may form an alkylene chain completing a 3, 4, 5, 6, 7, 8 or 9 membered alicyclic fused, spiro, bicyclic or tricyclic ring system or a combination thereof, which system may optionally include one or more non-adjacent carbonyl, oxa, alkylaza or arylaza groups;

with the proviso that when said biopolymers are copolymer having recurring units of the Structure I derived from trimethylene carbonate, the other recurring monomeric units of the copolymer are not derived from gylcolide or glycolic acid.

4,920,204

CERIC HYDROCARBYLOXY NITRATES AND THEIR USE IN ORGANIC SYNTHESIS

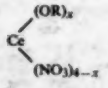
Peter S. Gradeff, Pottersville; Fred G. Schreiber, Highland Park, both of N.J.; Jean Grosbois, L'Isle Adam, France, and Heiko Mauermann, New Brunswick, N.J., assignors to Rhone-Poulenc Inc., New Brunswick, N.J.

Filed Nov. 12, 1987, Ser. No. 120,054

Int. Cl.[5] C07F 5/00

U.S. Cl. 534—15 **13 Claims**

1. Ceric hydrocarbyloxy nitrates having the general formula:



wherein x is 1, 2 or 3 and R is selected from the group consisting of aliphatic, cycloaliphatic and aromatic hydrocarbyl groups having from two to about twenty carbon atoms.

4,920,205

PROCESS FOR MAKING AZO PIGMENTS

Heinrich Rehberg, Brühl, and Hartmut Behringer, Erftstadt, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 40,338, Apr. 20, 1987, abandoned. This application Mar. 28, 1989, Ser. No. 329,647

Int. Cl.[5] C09B 29/38, 35/08, 37/00, 41/00

U.S. Cl. 534—582 **6 Claims**

1. A process for mixing azo pigments by subjecting a diazo component to an azo coupling reaction with the equivalent quantity of a coupling component difficultly soluble at less than 65° C. in the aqueous/acid and aqueous/neutral pH-ranges, which comprises: continuously mixing, in a first reaction step, an aqueous/alkaline solution of the coupling component with an aqueous solution of an acid selected from the group consisting of acetic acid, boric acid, phosphoric acid, hydrochloric acid or sulfuric acid at a temperature lower than 65° C. and within a period of less than 1 minute, during which the coupling component commences precipitating at least partially as reactive matter; continuously mixing, in a second reaction step immediately following the first reaction step, the suspension obtained with an aqueous/acid solution of the diazo component and with a recycled aqueous suspension of produced azo pigment at a temperature of less than 65° C. within a period of less than 6 seconds, and establishing a predetermined pH between 2 and 9 by controlling the flow of the mass streams of the diazo component and coupling component and thereby causing a portion of the coupling component to undergo immediate reaction to the azo pigment to be made; and reacting the balance portion of the coupling component in a post-reaction phase with unreacted diazo component to the azo pigment to be made.

4,920,206

PROCESS FOR MAKING AZO PIGMENTS

Hartmut Behringer, Erftstadt, and Heinrich Rehberg, Hürth, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 40,295, Apr. 20, 1987, abandoned. This application Mar. 29, 1989, Ser. No. 329,953

Claims priority, application Fed. Rep. of Germany, May 3, 1986, 3615099

Int. Cl.[5] C09B 29/38, 35/08, 37/00, 41/00

U.S. Cl. 534—582 **6 Claims**

1. A process for making azo pigments by subjecting a diazo component to an azo coupling reaction with the equivalent quantity of a coupling component difficultly soluble at less than 65° C. in the aqueous/acid and aqueous/neutral pH-ranges, which comprises: continuously mixing, an aqueous/acid solution of the diazo component at a temperature of less than 65° C., within a period of less than 6 seconds with the aqueous/alkaline solution of the coupling component and with a recycled aqueous suspension of produced azo pigment and establishing a predetermined pH between 2 and 9 by controlling the flow of the mass streams of the diazo component and coupling component and thereby causing a portion of the coupling component to undergo immediate reaction to the azo pigment to be made and simultaneously causing the balance portion of the coupling component to commence precipitating as finely crystalline reactive matter, and reacting the latter in a post-reaction phase with unreacted diazo component to the azo pigment to be made.

4,920,207

SELECTED REMOVAL OF TRITYL GROUPS FROM TRISPA

George H. Sankey, and Nigel J. Homer, both of Reading, Great Britain, assignors to Tate & Lyle Public Ltd. Co., United Kingdom

Filed Sep. 17, 1987, Ser. No. 98,023

Claims priority, application United Kingdom, Sep. 17, 1986, 8622342

Int. Cl.[5] C07H 1/00, 5/02, 13/02

U.S. Cl. 536—124 **13 Claims**

1. A process for the preparation of 2,3,4,3',4'-penta-O-acetyl sucrose by the selective removal of trityl groups from 6,1',6'-tri-O-trityl-penta-O-acetyl sucrose (TRISPA), comprising hydrogenating a solution of TRISPA and about 0.05 to 0.2 moles of aralkyl chloride (per mole of TRISPA) in an inert organic solvent in the presence of palladium or platinum as the catalyst.

4,920,208

BASIC AZO DYESTUFFS

Aloysius Engel, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

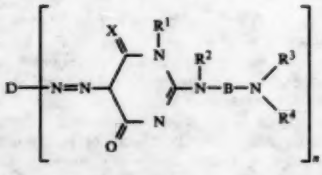
Filed Sep. 28, 1988, Ser. No. 250,572

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1987, 3735276

Int. Cl.[5] C09B 29/52, 31/14, 32/215, 35/26

U.S. Cl. 534—753 **5 Claims**

1. A basic azo dyestuff of the formula



or tautomers thereof, in which

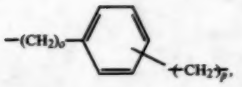
D is the radical of a diazo or tetrazocomponent free of anionic groups,

X is O or NH,

R^1, R^2 are independently of each other hydrogen, unsubstituted C_1–C_8- alkyl, C_1–C_8-alkyl substituted with halogen, hydroxyl, cyano, amino, monoalkylamino, dialkylamino or C_1–C_4-alkoxy; unsubstituted phenyl or phenyl substituted with halogen, hydroxyl, cyano, amino, monoalkylamino, dialkylamino, C_1–C_4-alkoxy or C_1–C_4-alkyl,

B is a —O—, —S—,

interrupted C_2–C_4-alkylene, in which R^5 is hydrogen, methyl, unsubstituted C_2–C_4-alkyl, C_2–C_4-alkyl substituted with chlorine, bromine, hydroxy, cyano, C_1–C_4-alkoxy, amino, mono-C_1–C_4-alkylamino or di-C_1–C_4-alkylamino or fluorine-, chlorine-, bromine-, C_1–C_4-alkyl- or C_1–C_4-alkoxy-substituted aryl or B is



wherein o is zero, 1, 2 or 3, P is 1, 2 or 3 and $(CH_2)_p$ is bonded to the

R^3, R^4 are independently of each other hydrogen, unsubstituted C_1–C_8-alkyl, C_1–C_8-alkyl substituted with halogen, hydroxyl, cyano, amino, monoalkylamino, dialkylamino or C_1–C_4-alkoxy; C_2–C_4-alkenyl; unsubstituted benzyl, unsubstituted phenylethyl or benzyl or phenylethyl substituted with fluorine, chlorine, bromine, C_1–C_4-alkyl, C_1–C_4-alkoxy, nitro, cyano, amino, mono-C_1–C_4-alkylamino or di-C_1–C_4-alkylamino or

R^2 and R^3 together with B and the two nitrogen atoms to which they are bonded form a 5- or 6-membered heterocyclic ring and in this case

B also stands for a direct bond,

R^3 and R^4 together with the nitrogen atom to which they are bonded form a 5- or 6-membered heterocyclic ring, and

n is 1 or 2.

4,920,209

ORAL VACCINES

Alan R. Davis, Wayne, and Paul P. Hung, Bryn Mawr, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 782,638, Oct. 4, 1985, abandoned, which is a continuation-in-part of Ser. No. 667,233, Nov. 1, 1984, abandoned. This application Jun. 4, 1987, Ser. No. 58,002

Int. Cl.[5] C12N *7/00, 15/00*; C12P *21/00*

U.S. Cl. 435—235 **1 Claim**

1. A recombinant adenovirus containing a gene coding for an antigen produced by a disease-causing organism said recombinant adenovirus being of type 7; the gene codes for hepatitis-B surface antigen; and the gene is located at delected early region 3; said recombinant adenovirus being ATCC VR2167.

4,920,210

2,6-DIAMINOPURINE-9-β-D-2',3'-DIDEOXYRIBOFURANOSIDE

George W. Koszalka, Apex, and Thomas A. Krenitsky, Chapel Hill, both of N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed May 15, 1986, Ser. No. 863,923

Claims priority, application United Kingdom, May 15, 1985, 8512330

Int. Cl.[5] C07H *19/04*

U.S. Cl. 536—24 **1 Claim**

1. 2,6-diaminopurine-9-β-D-2',3'-dideoxyribofuranoside or a pharmaceutically acceptable salt thereof.

4,920,211

MUTATED ADENOVIRUS E1A GENE FOR E1A PROMOTER STIMULATION

Clark Tibbetts, Nashville, Tenn., and Pamela L. Larsen, Brookline, Mass., assignors to Vanderbilt University, Nashville, Tenn.

Filed Jan. 4, 1988, Ser. No. 140,625

Int. Cl.[5] C12N *15/00*; C12P *21/00*; C07H *15/12*

U.S. Cl. 536—27 **12 Claims**

1. An isolated functional mutated E1A gene of human adenovirus subgroup B:1 having a modified autorepression functional domain including an in frame deletion in the region corresponding to the adenovirus wild type 3 (Ad3) DNA sequence between nucleotides 956 and 1024, said modified autorepression domain upon expression producing E1A products which stimulate in trans without net repression of an Ad3 promoter of the adenovirus subgroup B:1 E1A gene.

4,920,212

PROCESS FOR THE PREPARATION OF (ARYL)-(DIMETHYL)-(3-(4-FLUORO-3-ARYLOXY-PHENYL)PROPYL)SILANES

Hans H. Schubert, Frankfurt am Main, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

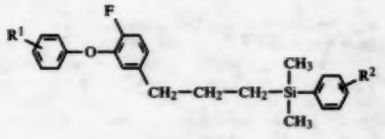
Filed Sep. 16, 1988, Ser. No. 245,404

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1987, 3731609

Int. Cl.[5] C07F *7/08*

U.S. Cl. 549—214 **6 Claims**

1. A process for the preparation of a compound of formula I



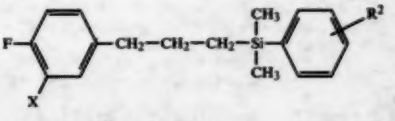
(I)

in which:

R^1 is hydrogen, halogen, $(C_1$–$C_4)$-alkyl or $(C_1$–$C_4)$-alkoxy; and

R^2 is hydrogen, halogen, $(C_1$–$C_4)$-alkyl, $(C_1$–$C_4)$-alkyl-thio, $(C_1$–$C_4)$-alkoxy or the bivalent group 3,4-O—CH_2—O;

which comprises reacting a compound of formula II

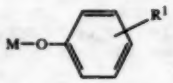


(II)

in which:

X is chlorine, bromine or iodine; and

R^2 has the meaning as in formula I;
in the presence of a copper catalyst with an alkali metal phenolate or alkaline earth metal phenolate of formula III



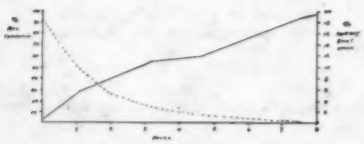
(III)

in which:
M is an alkali metal or an alkaline earth metal; and
R^1 has the meaning as in formula I.

4,920,213
METHOD AND COMPOSITIONS USEFUL IN PREVENTING EQUINE INFLUENZA
Beverly Dale, Mt. View, and Barbara Cordell, San Francisco, both of Calif., assignors to Biotechnology Research Partners, Ltd., Mountain View, Calif.
Continuation-in-part of Ser. No. 747,020, Jun. 20, 1985, Pat. No. 4,361,191. This application Jul. 21, 1986, Ser. No. 888,250
Int. Cl.[5] C12P *21/00, 21/02*; C07H *15/12*
U.S. Cl. 536—27 **2 Claims**

1. A recombinant DNA sequence encoding equine hemagglutinin H7 as depicted in FIG. 1.

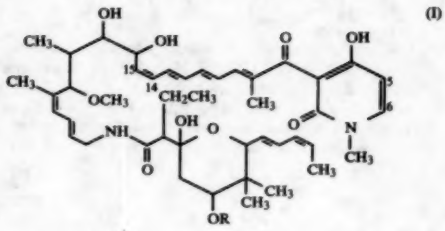
4,920,214
PROCESS FOR PRODUCING MODIFIED CYCLODEXTRINS
Robert B. Friedman, Chicago, Ill., assignor to American Maize-Products Company, Stamford, Conn.
Filed Apr. 16, 1986, Ser. No. 852,630
Int. Cl.[5] A61K *1/00*
U.S. Cl. 536—103 **18 Claims**



1. The process of modifying cyclodextrins to produce hydroxy ethers which comprises the steps of forming a substantially anhydrous mixture of one or more alpha, beta and gamma cyclodextrins and a selected alkylene carbonate in a basic environment in absence of a quaternary ammonium halide catalyst and heating the resulting mixture to a temperature of at least about 100° C. to initially produce visible bubbles coming off the mixture and to modify the one or more cyclodextrins and form an ether derivative.

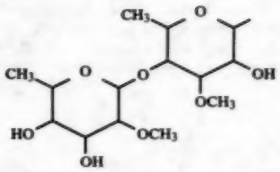
4,920,215
ANTIBIOTIC PRODUCED BY FERMENTATION
Kelvin S. Holdom, Ramsgate; John C. Ruddock, Canterbury, both of England; Junsuke Tone; Hiroshi Maeda, both of Chita, Japan, and Martin R. Jefson, Stonington, Conn., assignors to Pfizer Inc., New York, N.Y.
Filed Dec. 16, 1987, Ser. No. 133,752
Claims priority, application United Kingdom, Jan. 9, 1987, 8700513
Int. Cl.[5] C07G *11/00, 3/00*; A61K *35/00*; C12R *1/365*
U.S. Cl. 536—16.8 **6 Claims**

1. The antibiotic compound of the formula:



(I)

wherein R is



or a salt thereof.

4,920,216
SELECTIVE CHLORINATION OF STEROIDS AND OTHER SUBSTRATES DIRECTED BY COVALENTLY LINKED PYRIDINE DERIVATIVES ACTING AS TEMPLATES
Ronald Breslow, Englewood, N.J.; Michael Brandl, New York, N.Y.; Alan D. Adams, New York, N.Y., and Jurgen Hunger, New York, N.Y., assignors to The Trustees of Columbia in the City of New York, New York, N.Y.
Filed May 28, 1987, Ser. No. 55,139
Int. Cl.[5] C07J *43/00, 1/00*
U.S. Cl. 540—110 **24 Claims**

1. A method of substituting a chlorine atom for a predetermined hydrogen atom attached at the carbon-6, -9, -14, -17, or -20 position of a steroid, which steroid is selected from the group consisting of steroids of the cholestane, androstane, and pregnane series and has a hydroxyl group, comprising (a) reacting the steroid with an esterifying agent under suitable conditions so as to produce an ester, the esterifying agent comprising a pyridine ring or a substituted or fused ring derivative of a pyridine ring; and (b) treating the resulting ester with a chlorinating agent in an organic solvent under conditions such that the chlorine atom is substituted for the predetermined hydrogen atom.

4,920,217
PRODUCTION OF DIMETHYLAMINOMETHYL COPPER PHTHALOCYANINE
Ian A. Lambie, Glasgow; Paul I. W. Yarrow, Paisley; Robert Langley, Glasgow, and Colin D. Campbell, Beith, all of Scotland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed Sep. 19, 1988, Ser. No. 245,490
Claims priority, application United Kingdom, Oct. 3, 1987, 8723258
Int. Cl.[5] C09B *47/16*
U.S. Cl. 540—135 **4 Claims**

1. A process for the production of dimethylaminomethyl copper phthalocyanine having an average of 1 to 4 dimethylaminomethyl groups per molecule which comprises reacting aminomethyl copper phthalocyanine having an average of 1 to 4 aminomethyl groups per molecule with formaldehyde and aqueous formic acid at a concentration of 5 to 25%, at atmospheric pressure, and at an elevated temperature.

4,920,218

NOVEL HYDROXIDE MEDIATED FK-506 REARRANGEMENT PROCESS

David Askin; Todd K. Jones, both of Edison; Robert A. Reamer, Bloomfield; Ralph P. Volante, East Windsor, and Ichiro Shinkai, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

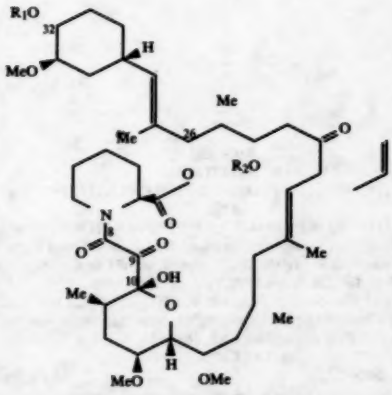
Continuation of Ser. No. 256,784, Oct. 12, 1988, abandoned. This application Sep. 5, 1989, Ser. No. 403,794

Int. Cl.[5] C07D *498/16, 498/18*

U.S. Cl. 540—456 10 Claims

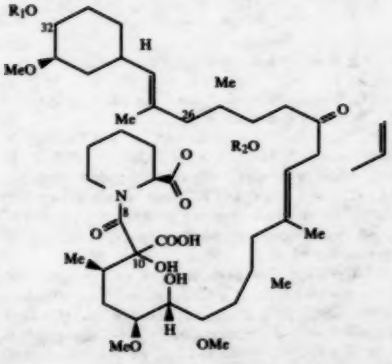
1. A process comprising the steps of:

(a) contacting compound 2:



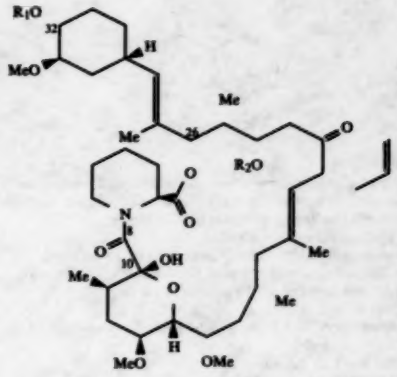
2

wherein R_1 and R_2 are independently H, or an easily removable hydroxy protecting group, with a hydroxide base in an inert aqueous/organic solvent mixture at room temperature in the range of about 0°–25° C. for a sufficient time to form 3;



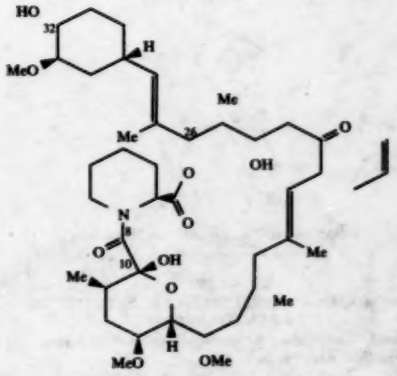
3

(b) contacting 3 obtained above with an oxidizing agent in an inert organic solvent at 0°–50° C. for a sufficient time to form 4;



4

(c) contacting the above-obtained 4 under mild acidic hydrolysis conditions for a sufficient time to remove R_2 and/or R_1 if either are present, to yield the immunosuppressant 5:



5

4,920,219

SUBSTITUTED SATURATED AND UNSATURATED INDOLE QUINOLINE AND BENZAZEPINE CARBOXAMIDES AND THEIR USE AS PHARMACOLOGICAL AGENTS

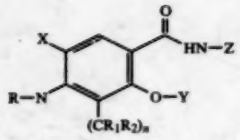
Jeffrey C. Pelletier, Lansdale, Pa.; Raymond D. Youssefyeh, Princeton Junction, N.J., and Henry F. Campbell, North Wales, Pa., assignors to Rorer Pharmaceutical Corp., Ft. Washington, Pa.

Filed Nov. 29, 1988, Ser. No. 277,582

Int. Cl.[5] C07D *453/02, 215/00, 209/34*

U.S. Cl. 540—523 7 Claims

1. A compound of the formula



wherein:

X is hydrogen, hydroxy, amino, mono- and di-loweralkylamino, halo, trifluoromethyl, sulfamyl, mono- and di-loweralkylsulfamyl or loweralkylsulfonyl;

R is hydrogen or loweralkyl;

R_1 and R_2 are independently hydrogen or loweralkyl;

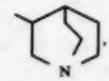
vicinal R_2 groups together may be, $-(CH_2)_a-$ where a is 1 to 4, thus forming a 3 to 6 membered ring;

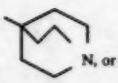
n is 2 to 4;

Y is loweralkyl, $-(CR_1R_2)_b$-SO-loweralkyl or $-(CR_1R_2)_b$-CO-loweralkyl;

b and d are 1 to 3; and

Z is $-(CR_1R_2)_d-NR_1R_2$,





or a pharmaceutically acceptable salt thereof.

4,920,220

CHROMOGENIC 1-HETEROCYCLIC SUBSTITUTED 2,4-BENZOXAZINES

Rox Pfaff, Rheinfelden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

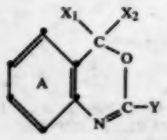
Filed Nov. 1, 1988, Ser. No. 265,645

Claims priority, application Switzerland, Nov. 12, 1987, 4418/87

Int. Cl.[5] C07D *413/04*

U.S. Cl. 544—90 **12 Claims**

1. A chromogenic 1-heterocyclic substituted 2,4-benzoxazine of formula



(I)

wherein X_1 and X_2 are identical or different heteroaromatic radicals selected from the group consisting of pyrrolyl, thienyl, indolyl, benzofuranyl, benzothienyl and naphthothienyl, wherein said radicals are unsubstituted, C-substituted by halogen, hydroxyl, cyano, nitro, lower alkyl, lower alkoxy, lower alkoxycarbonyl, C_1–C_8-acyl, amino, lower alkylamino, di-lower alkylamino, C_5–C_6-cycloalkyl, benzyl or phenyl, or N-substituted by C_1–C_{12}-alkyl, C_2–C_{12}-alkenyl, C_1–C_8-acyl, benzyl or phenethyl, each of which is unsubstituted or substituted by cyano, halogen, nitro, hydroxy, lower alkyl, lower alkoxy or lower alkoxycarbonyl, said heteroaromatic radicals being bonded to the oxazine ring through a carbon atom of a heterocyclic ring of said heteroaromatic radical, and X_2 is also an aryl radical, Y is hydrogen, alkyl, cycloalkyl, aryl, aralkyl or a heterocyclic radical selected from the group consisting of furyl, thienyl, pyrrolyl, pyrazolyl, imidazolyl and pyridyl, and the benzene ring A is substituted by halogen, cyano, nitro, lower alkyl, lower alkoxy, lower alkylthio, lower alkylcarbonyl, lower alkoxycarbonyl or $-NR_1-R_2$, in which R_1 and R_2 are each independently of the other hydrogen, alkyl of not more than 12 carbon atoms which is unsubstituted or substituted by halogen, hydroxy, cyano or lower alkoxy, or are cycloalkyl of 5 to 10 carbon atoms, or phenalkyl or phenyl, each unsubstituted or ring-substituted by halogen, cyano, lower alkyl or lower alkoxy, or $-NR_1R_2$ is a 5- or 6-membered heterocyclic radical.

4,920,221

SUBSTITUTED DECAHYDRO-1H-PYRIDO[1,2-F]PHENANTHRIDINES AND DECAHYDROPYRROLO[1,2-F]PHENANTHRIDINES

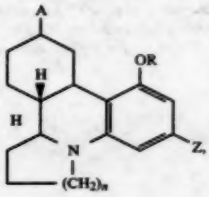
James F. Eggler, Stonington; Michael R. Johnson, Gales Ferry, and Lawrence S. Melvin, Jr., Ledyard, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 628,543, Jul. 6, 1984, Pat. No. 4,642,373, which is a division of Ser. No. 358,765, Mar. 16, 1982, Pat. No. 4,473,704. This application Oct. 16, 1986, Ser. No. 919,912

Int. Cl.[5] C07D *221/18*

U.S. Cl. 544—125 **18 Claims**

1. A compound having the stereochemical formula



in either racemic or optically active form, wherein

n is 1 or 2;

A is OH, (C_1–C_5)alkanoyloxy, (C_1–C_5)alkanoylamino or (C_1–C_4)alkanesulfonamido;

R is H, benzoyl, (C_1–C_5)alkanoyl or $-CO(CH_2)_mY$, wherein m is 1, 2, 3 or 4, Y is —COOH, or —NR'R", R' and R" when taken separately are each independently H or (C_1–C_4)alkyl, and R' and R" when taken together with the nitrogen to which they are attached are piperidino, pyrrolo, pyrrolidino, morpholino or N-[(C_1–C_4)alkyl]-piperazino; and

Z is (C_5–C_{13})alkyl, (C_5–C_{13})alkoxy, (C_5–C_{13})alkoxyalkyl, (C_8–C_{13})pyridylalkyl, (C_8–C_{13})pyridylalkoxy, (C_8–C_{13}-)pyridyloxalkyl, (C_8–C_{13})pyridylalkoxyalkyl, (C_9–C_{14})-phenylalkyl, (C_9–C_{14})phenylalkoxy, (C_9–C_{14})phenoxyalkyl, or (C_9–C_{14})phenylalkoxyalkyl, wherein said phenyl groups are optionally substituted with a chloro or a fluoro;

a pharmaceutically-acceptable acid addition salt thereof; or

a pharmaceutically-acceptable cationic salt thereof when R is $-CO(CH_2)_mY$ and Y is —COOH.

4,920,222

PREPARATION OF 3,3-DIARYLACRYLIC ACID AMIDES

Jürgen Curtze, Johannisberg; Ludwig Schröder, Ingelheim, both of Fed. Rep. of Germany, and Paul H. Briner, Faversham, England, assignors to Shell Internationale Research Maatschappij B.V., The Hague, Netherlands

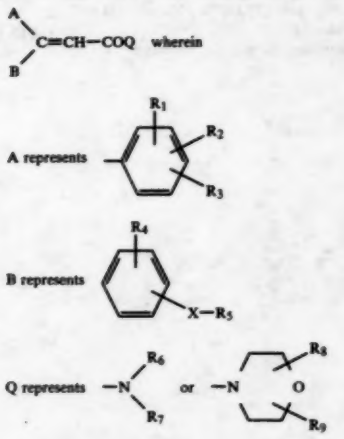
Filed Jan. 30, 1989, Ser. No. 302,938

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1988, 3805235

Int. Cl.[5] C07C 103/58, 102/00; C07D 295/18

U.S. Cl. 544—158 7 Claims

1. A process for the preparation of a 3,3-diaryl acrylic acid amide of general formula I



in which

R_1 is C_{1-4}-alkyl, C_{1-4}-alkoxy, NH_2, NHC_{1-4}-alkyl, $N(C_{1-4}$-alkyl$)_2$, C_{3-4}-alkenyl, C_{3-4}-alkynyl, C_{3-4} alkenyloxy, C_{3-4}-alkynyloxy, or C_{3-6}-cycloalkyl;

R_2 is C_{1-4}-alkyl, C_{1-4}-alkoxy or halogen;

R_3 is hydrogen or halogen;

R_4 is hydrogen, halogen, C_{1-4}-alkyl or C_{1-4}-alkoxy;

R_5 is hydrogen, a phenyl group optionally substituted by one or more substituents selected from C_{1-4}-alkyl, C_{1-4}-alkoxy and halogen moieties, a C_{1-12} alkyl group optionally substituted by one or more halogen atoms, a C_{3-7}-cycloalkyl, phenylphenyl, or phenoxyphenyl group, a C_{2-6}-alkenyl or C_{2-6}-alkynyl group each optionally-substituted by a phenyl group, or a naphthyl or C_{5-8}-cycloalkenyl group;

X is a single bond, —O—, —S(O)$_p$—, —N=N—, —CH-R_9O—, —OCHR_9—, —CHR_9S(O)$_p$—, —S(O)$_p$CHR_9— —$(CH_2)_n$—, —HC=CH—, or —C≡C—;

R_6 is C_{1-4}-alkyl, C_{3-7}-cycloalkyl, benzyl, C_{3-4}-alkenyl or C_{3-4}-alkynyl;

R_7 is C_{1-4} alkyl;

R_8 is hydrogen, C_{1-4}-alkyl or C_{1-4}-alkoxy;

R_9 is hydrogen or C_{1-4}-alkyl;

p is 0, 1 or 2; and

n is an integer from 1 to 10

provided that when X is —N=N— R_5 is other than hydrogen by reacting a benzophenone of formula II

in which A and B have the meanings given above, with an acetamide of formula III

in which Q has the meaning given above, in the presence of a base characterised in that the base employed is a sodium tertiary alcoholate.

4,920,223

AMINOPYRAZINONES AND AMINOTRIAZINONES

Beat Böhner, Binningen, and Willy Meyer, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

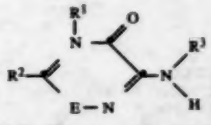
Division of Ser. No. 260,643, Oct. 21, 1988, Pat. No. 4,871,852, which is a division of Ser. No. 99,036, Sep. 21, 1987, Pat. No. 4,795,486. This application Jul. 25, 1989, Ser. No. 384,956

Claims priority, application Switzerland, Sep. 26, 1986, 3871/86

Int. Cl.[5] C07D 253/08; A01N 43/48, 43/64

U.S. Cl. 544—182 2 Claims

1. A compound of the formula II



in which E is nitrogen, R^1 is C_1–C_4-alkyl, R^2 is hydrogen, C_1–C_3-alkyl, C_1–C_3-halogenoalkyl, C_1–C_3-alkoxy, C_1–C_3-halogenoalkoxy, C_1–C_3-alkylthio, C_1–C_3-alkylsulfinyl, C_1–C_2-alkoxyethoxy, C_1–C_3-alkylsulfonyl, halogen or —NR^5R^6, R^3 is hydrogen or C_1–C_3-alkyl, and R^5 and R^6 independently of one another are hydrogen or C_1–C_3-alkyl, with the proviso that R^3 is C_1–C_3-alkyl if R^1 is methyl and R^2 is methyl or methylthio.

4,920,224

QUINAZOLIN-4(3H)-ONE DERIVATIVES AS ANTICOCCIDIAL AGENTS

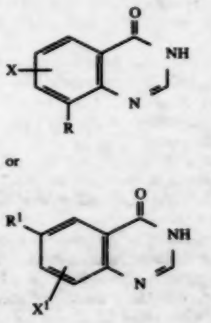
Edward A. Glazer, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 173,207, Mar. 24, 1988, Pat. No. 4,849,518, which is a division of Ser. No. 67,766, Jun. 22, 1987, Pat. No. 4,762,838. This application Mar. 13, 1989, Ser. No. 322,736

Int. Cl.[5] C07D 401/12

U.S. Cl. 544—284 1 Claim

1. A compound having the formula



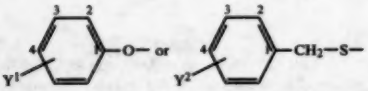
wherein

X is fluoro, chloro, bromo or iodo substituted at the 6- or 7-position;

R is (C_1–C_4)alkylthio;

X^1 is hydrogen or fluoro, chloro, bromo, iodo or methoxy substituted either at the 7- or at the 8-position;

R^1 is cyano, trifluoromethyl, (C_1–C_4)alkylthio 4-picolylthio, 3,5-dichlorophenoxy,



where Y^1 is hydrogen, fluoro, chloro, bromo or phenoxy; and Y^2 is chloro or bromo; with the proviso that Y^1 is other than hydrogen when X^1 is other than hydrogen.

4,920,225

RESOLUTION OF 1,4-DIHYDROPYRIDINE DERIVATIVES

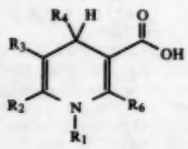
Gilles Genain, Issy-les-Moulineaux, France, assignor to Laboratoires Syntex S.A., Puteaux, France

Filed Dec. 22, 1986, Ser. No. 945,760

Int. Cl.[5] **C07F** *9/06, 9/22, 9/28;* **C07D** *215/36, 413/00, 215/16, 215/20, 213/72*

U.S. Cl. 546—21 **3 Claims**

1. A process for preparing the optical isomers of a compound of formula I



(I)

wherein

R_1 is H or lower alkyl;

R_2 and R_6 are each independently lower alkyl, aryl, or arylalkyl;

R_3 is CN, NO_2, CO_2R_5, $CONHR_5$, SO_2R_5, or $P(O)(OR_5)_2$, where R_5 is lower alkyl, lower alkoxyalkyl, alkoxyalkyl, aryl, or arylalkyl;

R_4 is aryl, heterocyclyl, or fused-ring heterocyclyl, optionally substituted with one, two, or three substituents independently selected from halo, NO_2, CN, lower alkyl, lower alkoxy, lower alkylamino, CF_3, OCH_2F, and OCF_3; which process comprises:

dissolving said compound of formula 1 and an optically active amine base in a ratio of about 1:2 to about 2:1, wherein said amine is cinchonidine, quinidine, strychnine, brucine, morphine, d-α-phenylethylamine, l-arginine, dehydroabietylamine, cinchonicine, cinchonine, 1-2-amino-1-propanol, d-amphetamine, glucosamine, conessine, or anabasine in a mixture of water and a solvent selected from dimethyl formamide, ethanol, and acetonitrile at a temperature between about 50° C. and the reflux temperature of said solvent for about 2 to about 30 minutes to form a racemic salt solution which is about 10% to about 50% water; and

allowing one optically active salt of said compound of formula 1 to crystallize.

4,920,226

INTERMEDIATES FOR THE PREPARATION OF (2-IMIDAZOLIN-2-YL)THIENO- AND FURO(2,3-B) AND (3,2-B) PYRIDINES

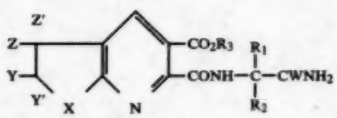
Marinus Los, Pennington; David W. Ladner, Hamilton Square, and Barrington Cross, Rocky Hill, all of N.J., assignors to American Cyanamid, Stamford, Conn.

Continuation of Ser. No. 176,542, Apr. 1, 1988, abandoned, which is a division of Ser. No. 929,681, Jan. 21, 1987, Pat. No. 4,752,323, which is a division of Ser. No. 676,133, Nov. 29, 1984, Pat. No. 4,650,514, which is a continuation-in-part of Ser. No. 611,191, May 21, 1984, abandoned, which is a continuation-in-part of Ser. No. 500,219, Jun. 2, 1983, abandoned. This application May 30, 1989, Ser. No. 358,926

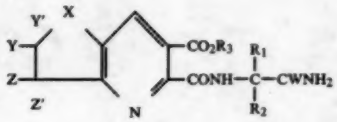
Int. Cl.[5] **C07D** *491/048, 495/04*

U.S. Cl. 546—80 **2 Claims**

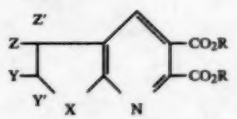
1. A compound having the structure:



(e)

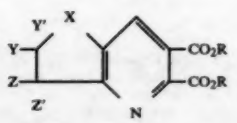


(f)



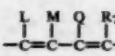
(g)

or



(h)

wherein ---- represents a single or a double bond; R is hydrogen or C_1–C_4 alkyl; R_1 is C_1–C_4 alkyl; R_2 is C_1–C_4 alkyl or C_3–C_6 cycloalkyl; and when R_1 and R_2 are taken together with the carbon to which they are attached they may represent C_3–C_6 cycloalkyl optionally substituted with methyl; R_3 is hydrogen; W is O or S; X is O, S, or, where ---- is a single bond S=O; Y and Y', Z and Z' are hydrogen, halogen, C_1–C_6 alkyl, C_1–C_6 alkoxy, C_1–C_6 alkanoyloxy, C_1–C_4 alkylthio, phenoxy, C_1–C_4 haloalkyl, C_1–C_4 haloalkoxy, nitro, cyano, C_1–C_4 dialkylamino or phenyl optionally substituted with one or two C_1–C_4 alkyl, C_1–C_4 alkoxy, halogen, or any combination of two of these groups with the proviso that when Y and Z are the same group they are H, halogen, alkyl or alkoxy, and when Y and Y' or Z and Z' are the same group they are hydrogen or alkyl; and, when taken together, Y and Z may form a ring in which YZ are represented by the structure $—(CH_2)_n—$, where n is an integer of 3 or 4, or



where L, M, Q and R_7 each represent hydrogen, halogen, C_1–C_4 alkyl or C_1–C_4 alkoxy, with the proviso that only one of

L, M, Q or R_7, may represent a substituent other than hydrogen;

the pyridine N-oxides thereof;

when R_1 and R_2 are not the same, the optical isomers thereof; and,

the acid addition salts thereof.

4,920,227

BENZOBICYCLIC CARBOXAMIDE 5-HT3 ANTAGONISTS

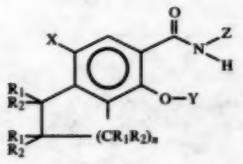
Jeffrey C. Pelletier, Lansdale, Pa.; Raymond D. Youssefyeh, Princeton Junction, N.J., and Henry F. Campbell, North Wales, Pa., assignors to Rorer Pharmaceutical Corp., Fort Washington, Pa.

Filed Nov. 29, 1988, Ser. No. 277,611

Int. Cl.[5] C07D *451/02, 211/60, 143/78, 149/41*

U.S. Cl. 546—133 **8 Claims**

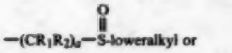
1. A compound of the formula



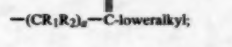
wherein:

X is hydrogen, hydroxy, amino, mono- and di-loweralkylamino, halo, trifluoromethyl, sulfamyl, mono- and di-loweralkylsulfamyl or loweralkylsulfonyl;

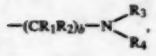
Y is loweralkyl,



or



Z is



4,920,228

N,N-DISUBSTITUTED, α-(3,5-DIALKYL-4-HYDROXYPHENYL)-α,α-DISUBSTITUTED ACETAMIDES AND COMPOSITION STABILIZED THEREWITH

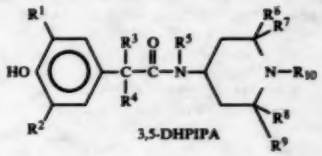
John Ta-Yuan Lai, Broadview Heights, and Pyong N. Son, Akron, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 22,183, Mar. 5, 1987, abandoned, which is a continuation-in-part of Ser. No. 713,715, Mar. 20, 1985, abandoned, which is a division of Ser. No. 549,036, Nov. 7, 1983, abandoned. This application Feb. 17, 1988, Ser. No. 156,765

Int. Cl.[5] C07D *211/58, 211/94*

U.S. Cl. 546—224 **4 Claims**

1. A N-substituted, N-polysubstituted piperidyl, α-(3,5-dialkyl-4-hydroxyphenyl)-α,α-substituted acetamide, represented by the structure



3,5-DHPIPA

wherein,

R^1 and R^2 each represent C_1–C_{12} alkyl, C_5–C_8 cycloalkyl, phenyl, naphthyl, alkylphenyl and alkyl-naphthyl each alkyl substituent being C_1–C_{12}, and at least one of R^1 and R^2 is t—C_4–C_{12} alkyl,

R^3 and R^4 each represent C_1–C_{18} alkyl, or, when together cyclized, represent C_5–C_{12} cycloalkyl,

R^5 represents hydrogen, C_1–C_{18} alkyl, phenyl, C_1–C_8 hydroxyalkyl, C_1–C_8 aminoalkyl, C_1–C_8 alkoxyalkyl, C_5–C_{12} cycloalkyl, and alkylphenyl having C_1–C_8 alkyl;

R^6, R^7, R^8, R^9, represents C_1–C_{12} alkyl, C_1–C_8 hydroxyalkyl, C_1–C_8 aminoalkyl, C_1–C_8 alkoxyalkyl, and, C_5–C_{12} cycloalkyl, and which in combination, R^6 with R^7, and R^8 with R^9, represent C_5–C_{14} cycloalkyl having at least four of the C atoms cyclized;

R^{10} is selected from the group consisting of hydrogen, oxygen, hydroxyl, C_1–C_{18} alkyl and C_1–C_{18} acyl.

4,920,229

NOVEL ALKOXYIMINO ETHER DERIVATIVES OF 5-ACYL-2(1H)-PYRIDINONES

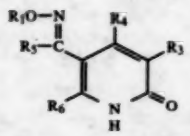
Winton D. Jones; Richard C. Dage, and Richard A. Schnettler, all of Cincinnati, Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Division of Ser. No. 166,147, Mar. 10, 1988, Pat. No. 4,849,522, which is a division of Ser. No. 834,692, Feb. 28, 1986, Pat. No. 4,732,982, which is a continuation of Ser. No. 548,398, Nov. 3, 1983, abandoned. This application Mar. 10, 1989, Ser. No. 321,704

Int. Cl.[5] C07D *405/12*

U.S. Cl. 546—283 **6 Claims**

1. A compound of the formula



or a pharmaceutically acceptable salt thereof, wherein

R_1 is $C_{1\text{-}10}$ alkyl,

R_3 is H, lower alkyl, —C≡N, —NH_2, —$CONH_2$ and —COOR with R being hydrogen of lower alkyl,

R_4 is hydrogen or lower alkyl,

R_5 is thienyl or furyl, and

R_6 is hydrogen, $C_{1\text{-}10}$ alkyl, phenyl, X-substituted phenyl, hydroxy or lower alkoxy, and X is lower alkyl, lower alkoxy, lower alkylthio, lower alkyl sulfonyl, lower alkyl sulfoxyl, halogen, nitro, lower alkanoyl, alkoxycarbonyl, carboxy, cyano, NH_2, $CONH_2$, COOR with R being hydrogen or lower alkyl, amidino, imidazol-2-yl, or CF_3.

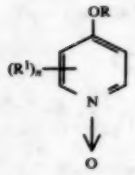
4,920,230

METHOD OF PRODUCING NITROGEN-CONTAINING HETEROAROMATIC COMPOUNDS HAVING AN ALKOXY GROUP

Masayasu Kato, Hyogo, Japan, assignor to Takeda Chemical Industries, Ltd., Higashi, Japan

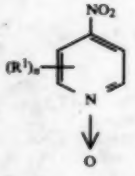
Filed Jun. 21, 1988, Ser. No. 209,374
Claims priority, application Japan, Jun. 29, 1987, 62-161899
Int. Cl.[5] C07D 213/62
U.S. Cl. 546—290 7 Claims

1. A method of producing a compound of the formula



wherein R is C_{1-8} alkyl, C_{1-8} alkyl halogenated with fluorine, bromine, chlorine or iodine, C_{6-14} aryl or aralkyl which is derived from C_{6-14} aryl and C_{1-3} alkyl, R^1 is C_{1-8} alkyl, C_{1-8} alkoxy, carboxyl or halogen, and n is an integer from 0 to 4, which comprises:

reacting a compound of the formula



wherein R^1 and n are defined above,

with a compound of the formula

ROM

wherein R is as defined above, and M is alkali metal,

in the presence of a phase transfer catalyst selected from the group consisting of quaternary ammonium salt, quaternary phosphonium salt, crown ether, cryptand and mixtures thereof, and a base selected from the group consisting of alkali metal, alkali metal hydride, alcoholate, alkali metal carbonate, alkali metal hydrogen carbonate and alkali metal hydroxide.

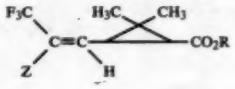
4,920,231

PROCESS OF BRAKING TRIFLOUROMETHYL COMPOUNDS

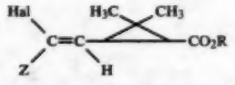
Werner Boain, Kelkheim; Jean-Pierre Demoute, Neuilly Plaisance, and Jean Tessier, Vincennes, all of France, assignors to Roussel Uclaf, Paris, France

Filed Mar. 30, 1989, Ser. No. 331,732
Claims priority, application France, Mar. 31, 1988, 88 04260
Int. Cl.[5] C07D 213/55
U.S. Cl. 546—300 13 Claims

1. A process for the preparation of a trifluoromethylvinyl compound of the formula (I) in all its possible stereoisomeric forms or mixtures thereof comprising reacting a salt of trifluoroacetic acid with a halovinyl compound of formula (II) in the presence of a cuprous salt to obtain the same stereo-specific trifluoromethylvinyl compound



(I)



(II)

Z is an electro-attracting group, Hal is a halogen, and R is a residue of a pyrethrinoid alcohol or an acid blocking alcohol.

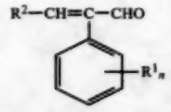
4,920,232

α,β-SUBSTITUTED ACROLEINS

Norbert Goetz, Worms; Stefan Karbach, and Hans-Gert Recker, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 27, 1988, Ser. No. 211,838
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1987, 3722886
Int. Cl.[5] C07D 213/56, 213/46, 211/30, 315/00
U.S. Cl. 546—338 4 Claims

1. An α-β-substituted acrolein of the formula



where R^1 is halogen, C_1–C_4-alkoxy, phenoxy, C_1–C_4-haloalkyl, C_1–C_4-haloalkoxy or nitro, n is an integer from 1 to 5, in the case of n being greater than 1 the R^1s being identical or different and in the event of nitro substitution the aromatic ring carrying not more than 3 nitro groups, and where R^2 is 2-pyridyl, 3-pyridyl or 4-pyridyl.

4,920,233

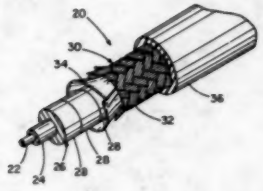
AUDIO CABLE

John W. Kincaid, Batavia, Ill., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Aug. 23, 1988, Ser. No. 235,297

Int. Cl.[5] H01B 7/34

U.S. Cl. 174—36 4 Claims



1. A coaxial cable for use in carrying electrical signals in the audio frequency range, said cable comprising:

a relatively flexible elongate metallic core disposed at the center of said cable;

a relatively flexible sleeve of a dielectric material positioned about said core;

a relatively flexible metallic shield disposed outwardly of said sleeve and coaxial with said core; and

a layer formed of ferrite positioned between said sleeve and said shield, said layer being in contact with the dielectric sleeve substantially throughout the length of said cable, said layer being made up of a series of axially aligned ferrite sleeves, each of said ferrite sleeves being relatively rigid, whereby the layer of ferrite substantially increases the inductance of the cable without a concomitant substantial increase in energy loss so that the cable exhibits substantially constant phase velocity characteristics across the audio frequency band.

4,920,234

ROUND CABLE HAVING A CORRUGATED SEPTUM

Timothy A. Lemke, Carlisle, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 67,767, Jul. 8, 1987, Pat. No. 4,800,236, which is a continuation-in-part of Ser. No. 892,300, Aug. 4, 1986, abandoned. This application Oct. 17, 1988, Ser. No. 258,769

Int. Cl.[5] H01B 7/34

U.S. Cl. 174—36 19 Claims

1. A cable comprising:

a substantially circular corrugated member having opposed surfaces thereon, each surface having an open groove formed therein, a conductive layer being disposed in each of the grooves, the conductive layers being in electrical contact with each other,

an electrical conductor disposed in each of the grooves, each conductor having a central axis extending therethrough, the axes of the conductors lying on a common, substantially circular locus,

a first and a second substantially circular conductive member respectively disposed in substantially concentric relationship adjacent one of the surfaces of the corrugated member and in electrical contact with the conductive layer on the surface to which it is adjacent,

each conductive member and the conductive layer which it is in contact cooperating to close an open groove and thereby to define an enclose tubular envelope receiving each conductor along its entire axial length,

the conductive members and the conductive layers being, in use, at a predetermined electrical potential such that each conductor in each envelope is substantially totally electromagnetically isolated along its entire axial length.

4,920,235

CONDUCTIVE CABLE SHEATH

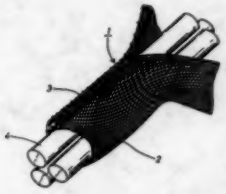
Akio Yamaguchi, Kasugai, Japan, assignor to Kitagawa Industries Co., Ltd., Aichi, Japan

Filed Nov. 28, 1988, Ser. No. 276,488

Claims priority, application Japan, Dec. 4, 1987, 62-185768[U]

Int. Cl.[5] H01B 7/34

U.S. Cl. 174—36 4 Claims



1. A cable sheath for forming a conductive surface around a cable comprising

a shielding strip comprising hookable, conductive material, and

at least one fastener comprising a base and hook-like protrusions, wherein the hook-like protrusions are capable of hooking into and retaining the shielding strip securely in position around a cable.

4,920,236

SEALING CABLE JUNCTIONS

Minoru Makiyo, Yachimata; Shigenori Goto; Hiroshi Yokosuka, both of Sakura, all of Japan; Robert L. Curtis, Trowbridge, and Philip J. Wade, Somerset, both of United Kingdom, assignors to Fujikura Ltd., Tokyo, Japan and ALH Systems Limited, Wiltshire, United Kingdom

Continuation of Ser. No. 112,911, Oct. 23, 1987, abandoned. This application Mar. 20, 1989, Ser. No. 326,402

Claims priority, application United Kingdom, Oct. 24, 1986, 8625479; Japan, Jan. 21, 1987, 62-11697; United Kingdom, Aug. 5, 1987, 8718535

Int. Cl.[5] H02G 15/08; H01R 43/00

U.S. Cl. 174—77 R 30 Claims

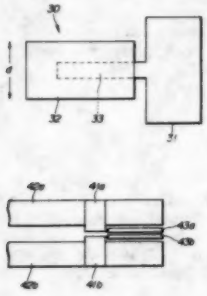
1. An insert part for sealing a cable junction, said insert part comprising:

(a) a block of heat-fusible material, said block having a central region and outer regions on opposite sides of said central region;

(b) a flange of heat-conductive material located beyond one of said ends of said block, said flange being planar;

(c) a tongue of heat-conductive material connecting said flange to said block, said tongue being formed by a single

component extending only into said block from said flange; and



wherein at least a part of said central region of said block is thicker in a direction perpendicular to the plane of said flange than said outer regions.

4,920,237

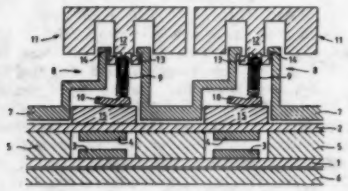
MEMBRANE KEYBOARDS

Richard A. Eardley, Largs; Brian J. Keenan, Merryhill Park; Ian A. Lawson, Largs, all of Scotland, and John McAllister, Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 2, 1989, Ser. No. 305,585

Int. Cl.[5] H01H *1/14*; B41J *19/04, 29/10*

U.S. Cl. 200—5 A **3 Claims**



1. A membrane keyboard comprising an array of key buttons, a pair of substantially parallelly disposed flexible membranes (1,2) located beneath the array of key buttons, each membrane carrying a plurality of contact pads (3,4) at positions corresponding to the key buttons, and acoustic noise absorbing material located underneath the key buttons above the membranes, said acoustic noise absorbing material comprising an expanding ink material (15) printed on the membrane (2) adjacent the key buttons at least in the areas corresponding to the positions of the contact pads and key buttons.

4,920,238

SELF-CENTERING SWITCH

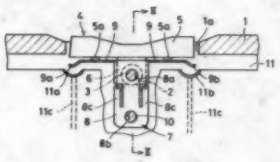
Hideo Aso, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan

Filed Nov. 1, 1988, Ser. No. 265,687

Claims priority, application Japan, Nov. 2, 1987, 62-168088[U]

Int. Cl.[5] H01H *21/24*

U.S. Cl. 200—6 R **5 Claims**



1. A self-centering switch comprising: a circuit board having a pair of spaced-apart fixed electric contacts mounted on a surface thereof; a stationary support rod disposed between the pair of fixed contacts; a pivotable rocker bar having a bar portion and a leg portion depending from the bar portion, the leg portion comprising a pair of resiliently spreadable fingers resiliently engageable with the support rod to thereby pivotally mount the rocker bar for pivotal movement in opposite directions about the support rod; and an electrical contact member having a pair of resiliently flexible arms each carrying a movable electrical contact and being electrically and structurally connected to said circuit board, the pair of flexible arms being positioned so that the movable contacts are opposite respective ones of the fixed contacts and the flexible arms resiliently engaging with the bar portion of the rocker bar to normally resiliently bias the rocker bar to a neutral position on the support rod in which the movable contacts are spaced from the respective fixed contacts so that pivotal movement of the rocker bar in one direction to one actuated position causes resilient flexure of one arm to move the movable contact carried thereby into electrical contact with one fixed contact and pivotal movement of the rocker bar in the other direction to another actuated position causes resilient flexure of the other arm to move the movable contact carried thereby into electrical contact with the other fixed contact, the rocker bar being returned from the actuated positions to the neutral position by the resilient bias of the arms.

4,920,239

ELECTRIC SWITCH, ESPECIALLY STEERING COLUMN SWITCH FOR MOTOR VEHICLES

Roland Bühler, Heilbronn; Herbert Erdelitsch, Bietigheim-Bissingen; Walter Hecht, Bietigheim-Bissingen, and Horst Rachner, Bietigheim-Bissingen, all of Fed. Rep. of Germany, assignors to SWF Auto-Electric GmbH, Bietigheim-Bissingen, Fed. Rep. of Germany

PCT No. PCT/EP87/00637, § 371 Date Jan. 23, 1989, § 102(e) Date Jan. 23, 1989, PCT Pub. No. WO88/09272, PCT Pub. Date Dec. 1, 1988

PCT Filed Oct. 28, 1987, Ser. No. 302,692

Claims priority, application Fed. Rep. of Germany, May 22, 1987, 3717251

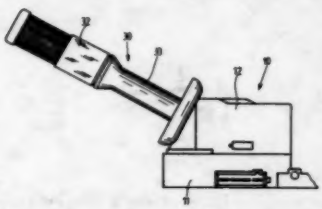
Int. Cl.[5] H01H *9/00*; B60Q *1/14*

U.S. Cl. 200—61.54 **11 Claims**

1. In an electric steering column switch;

a hollow housing including a base plate lying in a first general plane and a cover overlying said base plate, said housing having an opening in one side thereof, an intermediate plate fixedly mounted within said housing between said base plate and said cover in spaced parallel relationship to said base plate, means defining a relatively large diameter cylindrical recess in said intermediate plate and a relatively small diameter bore in said cover in coaxial

alignment with each other along a first axis normal to said first general plane, a carrier, first and second pivot means on said carrier respectively received in said cylindrical recess and said bore to support said carrier within said housing for rotation relative to said housing about said first axis, said carrier having an internal recess therein extending inwardly of said carrier from the side of said carrier adjacent said one side of said housing, elongate lever means having a longitudinal axis and an inner end located within said internal recess in said carrier and projecting from said internal recess through said opening in said housing to an outer end accessible at the exterior of said housing, said lever means including a sleeve like outer member and a rod like inner member rotatable within said outer member about said longitudinal axis, third pivot



means mounting said sleeve like member upon said carrier for pivotal movement relative to said carrier about a third axis normal to said longitudinal axis and parallel to said first general plane, a first slide member mounted between said base plate and said intermediate plate for movement relative to said housing along a first linear path parallel to said first general plane, post means coupled to said first slide member and projecting from said first member into said internal recess in said carrier slide through a first opening in said intermediate plate and a second opening extending coaxially through said first pivot means on said carrier, and first coupling means rotatively fixed to said rod like member of said lever means and engaged with said post to drive said first slide member in movement along said first path upon rotation of said rod like member about the longitudinal axis of said lever means.

4,920,240

METHOD OF OPERATING AN ELECTRIC CIRCUIT CONTROLLING DEVICE

Ronald W. Poling, Morrison, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 107,448, Oct. 13, 1987, abandoned, which is a division of Ser. No. 932,126, Nov. 18, 1986, Pat. No. 4,703,140.

This application Jul. 19, 1988, Ser. No. 221,113

Int. Cl.[5] H01H *35/34*

U.S. Cl. 200—83 P **26 Claims**

26. A method of operating an electric circuit controlling device, the device including a housing having a seat therein, a snap disc having opposed convex and concave surfaces with a marginal edge interposed therebetween and being operable generally with discrete snap action movement between a stable configuration and an unstable configuration, force transmitting means for movement in the housing, a caged spring, actuator means for axial movement in the housing, rotatable means for rotatable movement in the housing, and a set of resilient switch elements operable generally between a plurality of circuit controlling positions, respectively, the method comprising the steps of;

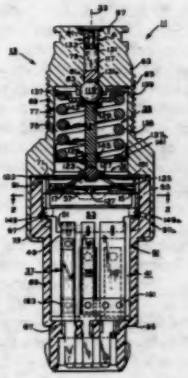
exerting the compressive force of the caged spring against the force transmitting means urging it toward an at-rest position in the housing;

applying the resiliency of at least one of the switch elements in one of the circuit controlling positions thereof onto the rotatable means rotating it into engagement with the actuator means to axially move the actuator means into abutment with the concave surface of the snap disc and biasing thereby the convex surface of the snap disc into engagement with the force transmitting means in the at-rest position thereof with the marginal edge of the snap disc being spaced from the housing seat;

subjecting the force transmitting means to fluid pressure and establishing thereby a force acting on the force transmitting means in opposition to the compressive force of the caged spring and the resiliency of the at least one switch element;

displacing the force transmitting means from its at-rest position when the force acting thereon exceeds a preselected force level and moving the snap disc conjointly with the force transmitting means toward the housing seat;

actuating the actuator means in part through its axial movement and the rotatable means in part through its rotatable movement and operating thereby the at least one switch element from the one circuit controlling position toward another of the circuit controlling positions thereof in



response to the movement of the snap disc toward the housing seat during the moving step;

seating the marginal edge of the snap disc in its stable configuration against the housing seat in response to the conjoint movement of the snap disc with the force transmitting means when the force acting thereon attains another preselected force level predeterminately greater than the first named preselected force level;

effecting the discrete snap action movement of the snap disc from the stable configuration toward the unstable configuration thereof when the force acting on the force transmitting means attains a third preselected force level predeterminately greater than the another preselected force level and transmitting the force from the snap disc in one direction onto the actuator means;

moving further the actuator means axially in response to the force transmitted in the one direction thereon by the snap disc upon its discrete snap action movement during the effecting step;

rotating further the rotatable means in response

4,920,241

HIGH SENSITIVITY DOOR EDGE SWITCH

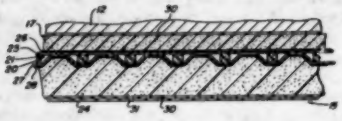
Norman K. Miller, Concordville, Pa., assignor to Miller Edge, Inc., Concordville, Pa.

Continuation of Ser. No. 40,607, Apr. 21, 1987, abandoned, which is a continuation-in-part of Ser. No. 812,075, Dec. 23, 1985, Pat. No. 4,661,664. This application Apr. 24, 1989, Ser. No. 342,642

The portion of the term of this patent subsequent to Apr. 28, 2004, has been disclaimed.

Int. Cl.[5] H01H *3/16*

U.S. Cl. 200—86 R **12 Claims**



1. A high sensitivity door edge switch used with a door having an edge for response to a low unit pressure applied over a large portion of the door edge, said door edge switch comprising, an inner element extending along the edge of said door having one face proximate the door edge, a resiliently compressible perforate spacer in facing relation with the other face of said inner element, said spacer including a plurality of spaced perforations extending generally perpendicular to said inner element, said spacer having a relatively greater elastic compressibility than said inner element, a substantially imperforate outer element in facing relation with said spacer remote from said inner element, said outer element having a relatively greater elastic compressibility than said spacer, said outer element being elastically deformable into the spacer perforations toward the inner element upon low unit pressure being applied over a large portion of the outer element and a pair of relatively flexible conductive elements located on opposite sides of said spacer and positioned respectively between the spacer and said inner and outer elements, said conductive elements being in spaced confronting relation through said spacer perforations in the absence of said low unit pressure and upon application of said low unit pressure to said outer element, at least one of said conductive elements deflecting into engagement with the other of said conductive elements by the elastic deformation of said outer element into all the spacer perforations encompassed by said large portion of the door edge.

4,920,242

ELECTRIC HIGH-VOLTAGE CIRCUIT BREAKER

Helmut Beier; Joaquin-Conrado Bohrdt, and Klaus Schuler, all of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

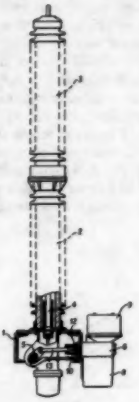
Filed Sep. 29, 1988, Ser. No. 251,107

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1987, 3733466

Int. Cl.[5] H01H *33/00*

U.S. Cl. 200—148 B **2 Claims**

1. An electric high-voltage circuit breaker, wherein movable contacts are supported by support insulators and arranged in an interrupter unit and actuated by a switching rod of insulating material and a reversing gear at ground potential by a hydraulic drive, the hydraulic drive having a piston rod extending through a seal and being brought out of a hydraulic cylinder and connected by a fork head guided in a protective tube and, on a side facing the piston rod being provided with a guiding ring connected to the reversing gear, the hydraulic cylinder being disposed between two housings for parts associated with the drive, in the interior spaces of which housings a heater and connections for ventilation and exhaust are arranged, passages being provided in the hydraulic cylinder for



connecting the interior spaces of both housings to the interior of the protective tube.

4,920,243

PUSH BUTTON SWITCH DEVICE WITH ILLUMINATING MEANS

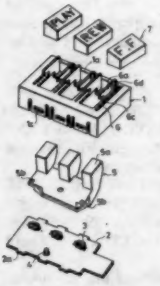
Tadashi Yuge, Iwaki, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Apr. 12, 1988, Ser. No. 180,297

Claims priority, application Japan, Aug. 11, 1987, 62-122800[U]

Int. Cl.[5] H01H *9/16*

U.S. Cl. 200—314 **4 Claims**



1. A push button switch device comprising:
a casing having a plurality of walls;
a pair of rockable members formed in an integral relationship with said casing, each of said rockable members extending from a first wall of said casing in a cantilever relationship with said first wall and each of said rockable members terminating in a free end, the free end of each rockable member including a protective wall extending vertically up from said free ends;
a pushing member connecting said free ends of said rockable members;
a key top supported on said protective walls;
a circuit board affixed to said casing and being positioned below and adjacent to said pushing member;
a switch means mounted on said circuit board below said

pushing member in an operative relationship with said pushing member such that when said key top is pushed, the deflection of said rockable members causes said pushing member to activate said switch means;

a light introducing member positioned above said circuit board and within said casing, said light introducing member having a portion which extends between said pushing member and under said key top to introduce light to said key top; and

a light source mounted on said circuit board in an operative relationship with said light introducing member, whereby light from the light source is conducted to said key top through said light introducing member.

4,920,244

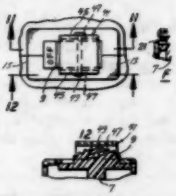
VACUUM CLEANER SWITCH RETAINER

Joseph J. Gundlach, 121 Moonglow Dr., Belleville, Ill. 62221

Continuation of Ser. No. 38,223, Apr. 14, 1987, abandoned. This application Aug. 10, 1988, Ser. No. 233,994

Int. Cl.[5] H01H *3/20*

U.S. Cl. 200—321 **6 Claims**



1. In an electrically powered appliance having a multiple position switch controlling application of power to the appliance, the switch being biased to one position whereby a user of the appliance can maintain the switch in another non-biased positon only by a constant application of manual force, an improvement comprising means for locking the switch in its non-biased position and maintaining the switch in that position without the constant application of manual force, the locking means including means slidably coacting with the switch and moving from a first position to a second position as the switch is moved from its biased to its non-biased position, the coacting means locking the switch in its non-biased position when the coacting means reaches its second position, the switch comprising a finger operated button movable from one position to another to move the switch from its biased to its non-biased position, and the locking means including a cap fitting over the button and resting on the cover of the appliance.

4,920,245

A PUSH-BUTTON SWITCH WITH UNIFORM ON AND OFF TIMINGS

Yasunari Takano, and Mitsuhiro Okada, both of Iwaki, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

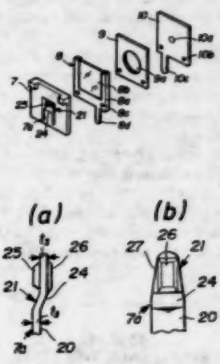
Filed Jun. 30, 1988, Ser. No. 213,374

Claims priority, application Japan, Oct. 22, 1987, 62-160750[U]

Int. Cl.[5] H01N *3/42*

U.S. Cl. 200—533 **1 Claim**

1. In a push-button switch having a casing, a pressing spring which operates upon movement of said stem, and a switch element disposed in said casing, said switch element operating so that when said stem is depressed, an acting projection of said pressing spring presses against a movable contact element pressing portion at an end of a leg portion of a pressing piece of said switch element causing a movable contact element of said switch element to contact a fixed contact element, and when the depressing force is removed, said push-button switch is returned to its non-depressed original state, the improvement comprising a movable contact element pressing portion of said pressing piece that gradually narrows, wherein said movable contact element pressing portion is of substantially the same thickness of material as said leg portion of said pressing piece, and said movable contact element pressing portion of said pressing piece is offset from said leg portion of said pressing piece, and said movable contact element pressing portion of said pressing piece has a projection provided on a surface thereof for contacting with said acting projection of said pressing spring, and said movable contact element pressing portion of said pressing piece has a rib provided on the opposite face thereof for pressing against said movable contact element.



4,920,246

HIGH FREQUENCY HEATING APPARATUS USING MICROCOMPUTER CONTROLLED INVERTER

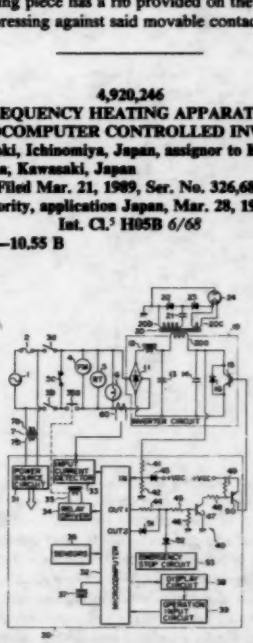
Masayuki Aoki, Ichinomiya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 21, 1989, Ser. No. 326,682

Claims priority, application Japan, Mar. 28, 1988, 63-73793

Int. Cl.[5] H05B *6/68*

U.S. Cl. 219—10.55 B **9 Claims**



1. A high frequency heating apparatus comprising:

a high frequency heating source for providing a predetermined high frequency heating output;

inverter means for receiving an AC input and providing a high frequency output for driving said high frequency heating source, said inverter means including rectifying

means for rectifying the AC input and a switching element for switching a DC output from said rectifying means;

voltage detecting means for detecting an output voltage value from said switching element of said inverter means;

microprocessing means for outputting on On/Off signal with generation timing determined by interrupt processing in accordance with output voltage value detected by said voltage detecting means, said microprocessing means including:

(a) generating means for generating a reference clock;

(b) counter means for counting reference clocks generated by said generating means in accordance with a set output value associated with the high frequency heating output;

(c) ON/OFF signal generating means for outputting the ON/OFF signal having the ON and OFF periods corresponding to a count result of said counter means;

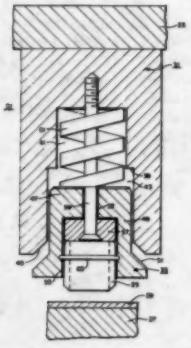
driving means for driving said switching element of said inverter means in accordance with the ON/OFF signal output from said microprocessing means.

4,920,247

RESISTANCE WELDING

Thomas A. Ward, Holts Summit, and Larry K. Gove, Linn, both of Mo., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 14, 1988, Ser. No. 270,559
Int. Cl.[5] B23K *11/02, 9/24*
U.S. Cl. 219—103 **11 Claims**



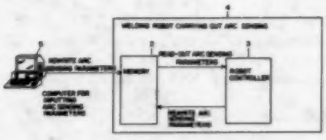
9. In resistance welding apparatus for joining metallurgically a member of small transverse cross-section endwise to a plate by transmitting welding current through welding electrodes and said member and plate; a holder for said member including: an electrically conducting block having a cavity therein, said block being shaped to form a joint of low electrical resistance with one of said electrodes when in engagement therewith, a collet for receiving said member, and means connected to said bloc and collet axially movable within said cavity, said block and collet having means cooperative to actuate said collet to clamp a member and to establish a path of low electrical resistance through said block, said collet and said member by the movement inwardly of the cavity of said collet under the force exerted between said member and plate when said member is brought into engagement with said plate to be metallurgically joined to said plate.

4,920,248

ARC SENSING WELDING APPARATUS CONTROLLED BY PROGRAM

Kenichi Toyoda, Hino; Toru Mitsuno, Tama; Nobutoshi Torii; Yuichi Kanda, both of Hachioji, and Shigehiro Morikawa, Atsugi, all of Japan, assignors to Fanuc, Ltd., Yamanashi, Japan

PCT No. PCT/JP88/00048, § 371 Date Sep. 22, 1988, § 102(e) Date Sep. 22, 1988, PCT Pub. No. WO88/05363, PCT Pub. Date Jul. 28, 1988
PCT Filed Jan. 23, 1988, Ser. No. 261,966
Claims priority, application Japan, Jan. 23, 1987, 62-12579
Int. Cl.[5] B23K *9/12*
U.S. Cl. 219—124.34 **6 Claims**



1. An automatic welding apparatus for carrying out an arc sensing control operation in accordance with an operating program which is incorporated therein, comprising:

a deviation detecting means for detecting deviations of a welding electrode from a predetermined path in an up or down direction and right or left direction by detecting variations in a welding current while welding in a weaving manner;

a deviation correcting means for correcting said deviations;

a memory means for storing parameters for arc sensing; and

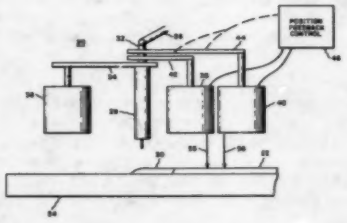
a memory automatic rewriting means for automatically rewriting parameters in said memory means at a predetermined time in accordance with said operating program.

4,920,249

WELD BEAD WETTING ANGLE DETECTION AND CONTROL

Michael H. McLaughlin, Scotia; Carl M. Penney, Schenectady, and Robert E. Sundell, Clifton Park, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 8, 1989, Ser. No. 351,000
Int. Cl.[5] B23K *9/12*
U.S. Cl. 219—130.21 **20 Claims**



1. A method comprising the steps of:

producing a bead by moving a bead producing tool along one or more workpieces, said bead having first and second bead wetting angles, each bead wetting angle being between a corresponding edge of said bead and an adjacent surface on said one or more workpieces;

generating profile information by use of at least a first optical profiler head moved along said bead, said profile information representative of the profile of at least part of said bead behind said bead producing tool;

deriving bead wetting angle data representative of at least one of said first and second bead wetting angles from said profile information;

comparing the bead wetting angle data to at least one reference;

calculating a changed value for at least one parameter, which parameter affects at least one of said bead wetting angles, said changed value of said at least one parameter being dependent on the results of the comparison; and

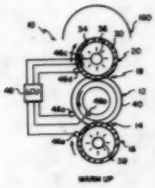
changing the operation of said bead producing tool based on the changed value of said at least one parameter to realize feedback control of said at least one of said first and second bead wetting angles.

4,920,250

FUSING APPARATUS WITH SELF-LEARNING HEATER

Carl T. Urban, Hilton, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 29, 1988, Ser. No. 291,837
Int. Cl.[5] H05B *1/00*; G03G *15/00*
U.S. Cl. 219—216 **10 Claims**



1. In an electrostatographic copier or printer, an apparatus for fusing tone images to suitable substrates or copy sheets of paper by heat and pressure, the apparatus including:

(a) a pressure roller;

(b) a fuser roller forming a fusing nip with said pressure roller through which substrate or copy sheets carrying toner images for fusing can be run; and

(c) a self-learning heater roller in heat transfer relationship with said fuser roller for effectively replacing heat lost by said fuser roller to such substrates or copy sheets, said heater roller including (i) logic and control means capable of monitoring temperature variations due to heat lost by said fuser roller to such substrates or copy sheets, (ii) a heat source for heating said heater roller to original temperature setpoint, and (iii) means for resetting such original temperature setpoint of said heater roller in direct response to such monitored temperature variations.

4,920,251

COMPACT, EFFICIENT, EASY-TO-CLEAN FOOD STEAMER FOR HOME USE, WITH SAFETY FEATURES AND VERSATILE MODULAR FOOD COMPARTMENT

Joan E. Whitenack, Arcadia; George Sanchez, Northridge; Earlyn W. Stone, Nuevo, and Buddy A. Colton, El Monte, all of Calif., assignors to Acry Industries, Incorporated, Azusa, Calif.

Filed Feb. 28, 1989, Ser. No. 317,013
Int. Cl.[5] A47J *27/05*
U.S. Cl. 219—401 **11 Claims**

1. Apparatus for steam-cooking food, comprising:

means for receiving a quantity of water and applying heat to convert the water to steam;

at least one unitary molded plastic basket closely but removably fitted to the receiving-and-applying means to capture the steam, and having:

a perforated floor for supporting such food, and for passing the steam upward into the basket and returning condensed steam as water to the receiving-and-applying means for reuse, said floor having a periphery, and

four upstanding walls, erected substantially along the periphery, for confining the steam and such food in mutual contact; and

a plastic cover dimensioned to be closely but removably fitted upon the walls of the basket to confine the steam within the basket and to collect some condensed steam for return through the floor for reuse;

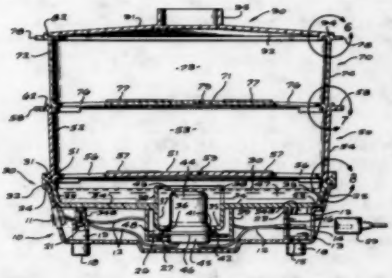
whereby water and food-juice deposits are easily cleaned from the floor of the plastic basket; and

whereby the basket and cover together can retain the steam in contact with such food without any added exterior enclosure;

a second unitary plastic basket interposed between the first-mentioned basket and the cover, and closely but removably fitted to the first-mentioned basket to capture steam rising therefrom, for supporting and confining additional such food and steam in mutual contact, said second basket having:

a perforated floor for supporting such food, and for passing the steam upward into the basket and returning condensed steam as water through the first-mentioned basket to the receiving-and-applying means for reuse,-said floor of the second basket having a periphery, and

four upstanding walls erected substantially along the periphery of the second basket floor for confining such additional food and steam in mutual contact; said second-basket walls being dimensioned to be closely but removably interfitted, in place of the first-mentioned-basket walls, with the cover; and



whereby the apparatus is selectably usable, at the option of a user, either for larger quantities of food without duplication of the receiving-and-applying means and cover, or for smaller quantities of food without wasting time and heat required to fill two baskets with steam;

wherein the walls of the baskets are dimensioned for close mutual fitting of the second basket inverted upon the first-mentioned basket to form therewith a single double-height enclosure for large pieces of such food; and

wherein the cover is dimensioned for close fitting upon the floor of the second basket when inverted, to confine the steam within the double-height enclosure;

whereby the apparatus is further selectably usable for such larger quantities of food, at the option of a user, either in the form of shallow pieces of such food which could not be as quickly and effectively cooked if all stacked together in a double-height enclosure, or tall pieces of such food which could not fit within the height of a single basket.

4,920,252

TEMPERATURE CONTROL METHOD FOR DISTRIBUTING POWER TO A PLURALITY OF HEATING ELEMENTS

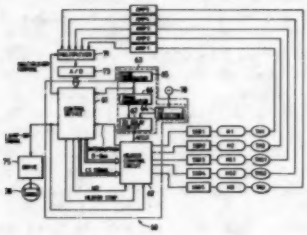
Tatsuo Yoshino, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 14, 1988, Ser. No. 270,589
Claims priority, application Japan, Feb. 5, 1988, 63-25333
Int. Cl.[5] H05B *1/02*
U.S. Cl. 219—497 **6 Claims**

1. In a temperature control method using a heating means and a temperature detecting means for each of a plurality of

objects which are temperature controlled according to sequential, predetermined intervals of time designated as heater switching control cycles, said method comprising the steps of:

(a) controlling the heating of each of said heating means, for each cycle of said heater switching control cycles, by measuring and storing a temperature of each of said objects using said temperature detecting means, and in response thereto, allocating a specific length of actuating time and a specific cycle portion for controlling a heating means of each respective object, such that a total energy



requirement for activating a subset of said heating means at any given time during said each cycle is maintained within a range of a predetermined rated capacity; and

(b) actuating each of said heating means according to said specific length of actuating time and said specific cycle portion.

4,920,253

CONTROL DEVICE FOR A COOKING APPARATUS WHICH CONTROLS A PLURALITY OF FUNCTIONS USING A SINGLE RESISTANCE ELEMENT

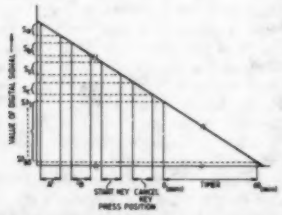
Tamotsu Takei, Nagoya, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Continuation of Ser. No. 65,370, Jun. 23, 1987, abandoned. This application Jan. 5, 1989, Ser. No. 293,611

Claims priority, application Japan, Jun. 24, 1986, 61-147535; Oct. 24, 1986, 61-253205

Int. Cl.[5] H05B *1/02*

U.S. Cl. 219—506 **15 Claims**



1. A control device for a cooking apparatus, comprising:

input means for allowing designation of commands of a plurality of different cooking conditions, including a plurality of manually operable contact keys;

common resistance means responsive to a manual operation of the contact keys, for generating a voltage within a defined range corresponding to one of the contact keys which has been operated, including a single, continuous resistance element, across which a voltage is applied, and an area of which is connected to produce a voltage based on which key has been operated; and

processor means responsive to the voltage from the resistance means for determining whether said voltage from said resistance means is any one of a plurality of acceptable voltages, generated by a corresponding proper depressing of said input means or an unacceptable voltage having a value between two adjacent acceptable voltages generated by an improper depressing of said input means and for recognizing one of the plurality of commands based on the acceptable voltage, the processor means overriding the unacceptable voltage from the resistance means for avoiding a false recognition of the designated command thereby.

4,920,254

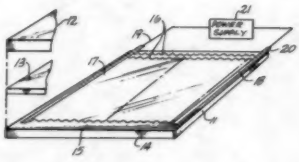
ELECTRICALLY CONDUCTIVE WINDOW AND A METHOD FOR ITS MANUFACTURE

Howard S. DeCamp, Northridge; John A. Raffo, Simi Valley, and Alex Z. Bimanand, Burbank, all of Calif., assignors to Sierracin Corporation, Sylmar, Calif.

Filed Feb. 22, 1988, Ser. No. 158,579

Int. Cl.[5] B60L *1/02*

U.S. Cl. 219—547 **23 Claims**



1. A method for forming a window including an electrically conductive layer on at least a portion of its surface comprising:

selecting a rigid transparent substrate;

coating a surface of the substrate with a solution comprising an ultraviolet polymerizable acrylate resin and a solvent for the resin;

evaporating substantially all of the solvent to leave a base coat of polymerizable acrylate resin on the substrate;

exposing the base coat to sufficient ultraviolet radiation to polymerize the acrylate, said coating through polymerizing steps being conducted in an environment at a temperature in the range of from 60° to 65° F. and at a relative humidity in the range of from 30 to 50%; and

depositing an electrically conductive metal layer on at least a portion of the base coat.

4,920,255

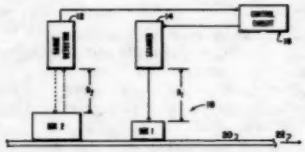
AUTOMATIC INCREMENTAL FOCUSING SCANNER SYSTEM

Stephen C. Gabeler, Sudbury, Mass., assignor to Stephen C. Gabeler, Canton, Mass.

Filed Oct. 31, 1988, Ser. No. 264,872

Int. Cl.[5] G06K *7/10, 7/14*

U.S. Cl. 235—454 **15 Claims**



1. An automatic incremental focusing scanner system for optically reading a code pattern on an object, comprising:

scanner means for directing a radiation beam onto the object at one of a plurality of focal lengths;

range means for determining the range of the object relative to said scanner means;

means for altering the focal length to selectively focus the radiation beam; and

control means, responsive to said range means, for commanding said means for altering to adjust the focal length established by said means for altering based on the determined range to enable accurate reading of the code pattern.

4,920,256

UNIVERSAL ELECTRONIC PAYMENT TERMINAL BASE INCLUDING MEMORY CARD PROGRAMMING VOLTAGE BOOSTER

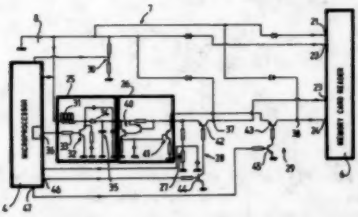
Jacques Marty; Jérome Tremblet, both of Bourg les Valence, and Jean-Jacques Delorme, Valence, all of France, assignors to Crouzet, Paris, France

Filed Mar. 1, 1988, Ser. No. 162,541

Claims priority, application France, Mar. 2, 1987, 87 02788

Int. Cl.[5] G06K *1/00*

U.S. Cl. 235—441 8 Claims



1. A base for an electronic memory card payment terminal, said base comprising a microprocessor connectable to an electric supply source, memory means for storing an application program and a transaction program, said memory means connected to said microprocessor, receiving means included in said microprocessor for the reception of customer identification information, a memory card reader driven by said microprocessor, and a voltage source for programming memory cards, said voltage source being derived from said electric supply source and being variable to meet various programming voltage requirements, said electric supply source being no greater than the smallest of the programming voltages required, said voltage source comprising a voltage booster circuit provided between said electric supply source and said memory card reader and a variable cyclic ratio pulse generator circuit for controlling said voltage booster circuit.

4,920,257

LIGHT FILTER WITH ATUOMATIC REGULATION OF OPTICAL TRANSMISSION

Rupert Fuerthbauer, and Rolf Bruhin, both of Kratzstrasse 35, CH-8620 Wetzikon, Switzerland

Filed Oct. 9, 1987, Ser. No. 107,331

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1986, 3634508

Int. Cl.[5] G02F *1/13;* G05D *25/02*

U.S. Cl. 250—201.1 15 Claims

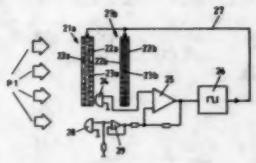
1. Light filter means with automatic regulation of optical transmission comprising:

a liquid crystal filter element which is adjustable to vary the optical transmission of visible light therethrough;

a first optical sensor for detecting incident and background light, said first optical sensor producing an electric signal for regulating the optical transmission of said liquid crystal filter element in accordance with the radiation received by said first sensor, said first optical sensor being located behind said liquid crystal filter element in the direction of radiation emission;

a second optical sensor being arranged beside or in front of said liquid crystal filter element in the radiation emitting direction;

a regulating circuit for controlling the optical transmission of visible light through said liquid crystal filter element including a subtraction circuit which subtracts the signal



generated by one of said first and second optical sensors from the signal of the other of said first and second optical sensors, the output signal of said regulating circuit being at least approximately proportional to the amount of visible light in front of said filter element.

4,920,258

RECORDING APPARATUS WITH CARRIAGE-DRIVING/SHEET-FEEDING MECHANISM

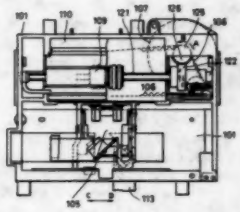
Yasuhide Saito, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 23, 1989, Ser. No. 299,343

Claims priority, application Japan, Jan. 30, 1988, 63-20804

Int. Cl.[5] G01D *15/24*

U.S. Cl. 346—134 6 Claims



2. A recording apparatus comprising:

a carriage for carrying a printing head capable of recording on a recording sheet;

a drive belt secured to said carriage for reciprocating said carriage relative to the recording sheet when said drive belt is driven;

a rotatable feed roller for feeding the recording sheet past the printing head when said feed roller is driven;

a reversible motor having a rotatable motor shaft for driving said drive belt and said feed roller;

a drive pulley mounted to said motor shaft to rotate therewith, wherein said drive belt passes over said drive pulley to reciprocate said carriage in different directions when said motor shaft is rotated in respective different directions;

a worm wheel mounted to said feed roller to rotate therewith to feed a recording sheet when said worm wheel is rotated in a predetermined direction;

a worm gear mounted to said motor shaft to rotate therewith, wherein said worm gear meshes with said worm wheel to rotate said worm wheel in different directions when said motor shaft is rotated in respective different directions; and

a one-way clutch cooperating with said feed roller and said

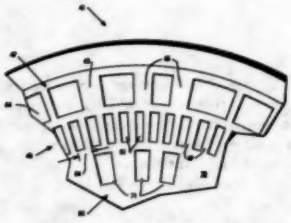
worm wheel to transmit the rotation of said worm wheel to said feed roller only in the predetermined direction.

4,920,259

APPARATUS FOR PRODUCING A PHASE INSENSITIVE INDEX PULSE FOR MOTION ENCODERS

Howard Epstein, Los Altos, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 30, 1988, Ser. No. 252,222
Int. Cl.[5] G01D *5/34*
U.S. Cl. 250—237.13 **19 Claims**



9. An encoder for indicating an object's movement along a route, the encoder comprising:

emitter means for emitting energy along an energy path;

energy modulation means positioned in the energy path for modulating the energy in response to the object's movement along the route, the energy modulation means including a code member having an incremental movement energy modulation track that extends along the route, and at least one set of two index energy modulation tracks, the two index energy modulation tracks of each set being positioned on opposite sides of, and a substantially equal distance from the incremental movement energy modulation track.

incremental movement detector means positioned in the energy path for receiving the energy modulated by the incremental movement energy modulation track and for generating at least one encoder output signal in response to the object's movement along the route;

one set of two index detector means for each set of index energy modulation tracks, the two index detector means of each said set being positioned in the energy path on opposite sides of, and a substantially equal distance from the incremental movement energy modulation track, for receiving the energy modulated by one of the sets of index energy modulation tracks and for generating two index signals that each reach their extreme amplitude at least once during each excursion of the object across the route, the two index signals reaching their respective extreme amplitude simultaneously when there is no misalignment between the energy modulation means and the incremental movement and index detector means; and

means for combining the two analog index signals for obtaining a phase insensitive index pulse.

4,920,260

DETECTOR SYSTEM FOR OPTICAL MOUSE

Kenneth E. Victor, Mountain View, and Carl A. Goy, Fremont, both of Calif., assignors to MSC Technologies, Inc., Fremont, Calif.

Filed Aug. 30, 1988, Ser. No. 238,716
Int. Cl.[5] G01V *9/04*
U.S. Cl. 250—221 **23 Claims**

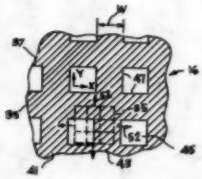
1. An improved optical position detector system comprising,

means forming a surface having a grid pattern thereon with two sets of intersecting orthogonal grid lines, said grid lines having a predetermined width and a first reflectivity and defining spaces therebetween of a second contrasting reflectivity;

an optical mouse movable over said surface, and including means for illuminating a portion of said grid pattern on said surface, and

an array of detector elements disposed for imaging areas of said illuminated portion, each of said elements being operative to generate an electrical signal proportional to the quantity of light received from said illuminated portion, said array including

at least four pairs of elements for detecting motion of said mouse in a particular first direction relative to said surface, two of said pairs forming a first set of pairs and two of said pairs forming a second set of pairs, said elements of each said set being disposed within said array such that when any one element of a pair in a set images a space, the other element of the pair images a line, and movement of



said mouse in said first direction over a distance of at least said line width causes a change in the voltage level of the electrical signal generated by one element in said first set which is approximately 180 degrees out-of-phase with the change in the voltage level of the electrical signal generated by another element in said first set, and a change in the voltage level of the electrical signal generated by one element in said second set which is approximately 180 degrees out-of-phase with the change in the voltage level of the electrical signal generated by another element in said second set, and such that the electrical signal generated by said one element in said first set either lags in time or leads in time the electrical signal generated by said one element in said second set; and

system processor means operative to receive said electrical signal from each of said elements and to determine an amount and direction of movement of said mouse in said first direction.

4,920,261

BIREFRINGENT OPTICAL FIBER DEVICE FOR MEASURING OF AMBIENT PRESSURE IN A STABILIZED TEMPERATURE ENVIRONMENT

Wojtek J. Bock, Gloucester, Canada, and Andrzej W. Domanski, Warszawa, Poland, assignors to Universite Du Quebec A Hull, Hull, Canada

Filed May 24, 1989, Ser. No. 356,244
Int. Cl.[5] G02F *1/01*
U.S. Cl. 250—225 **11 Claims**

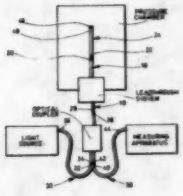
1. Birefringent optical fiber device for measuring of ambient pressure in a stabilized temperature environment, when connected respectively to a light source and a measuring apparatus, comprising:

first means for receiving polarized light from said light source, and transmitting said polarized light;

a birefringent optical fiber having a solid content, said birefringent fiber being connected to said first means for receiving said polarized light which has light signal components polarized along two orthogonal polarization axes of said birefringent fiber, said birefringent optical fiber having a preselected length determined by a range of pressures to be measured, said polarized light being injected into said birefringent fiber in a direction parallel to a

longitudinal axis of said birefringent fiber, said birefringent fiber being adapted to be submitted to said environment; and

second means for receiving light signals emitted from said birefringent fiber, said light signals having an elliptical polarization state characterized by major and minor axes,



whereby cross-talk between said light signal components along said polarization axes being responsive to said ambient pressure in said environment, said measuring apparatus detecting said light signals from said second means to provide an output signal indicative of said ambient pressure.

4,920,262

PHOTOELECTRIC DEVICE WITH LEADS

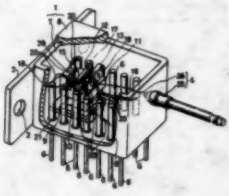
Kunio Aiki; Atsushi Sasayama; Tugio Nemoto; Makoto Haneda, all of Komoro; Satoru Ishii, Tamamura; Haruo Kuginiya, Komoro, and Tutomu Kawasaki, Tsuchiura, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Tobu Semiconductor, Saitama, both of, Japan

Division of Ser. No. 54,392, May 26, 1987, Pat. No. 4,803,361. This application Feb. 3, 1989, Ser. No. 305,542

Claims priority, application Japan, May 26, 1986, 61-119235; May 26, 1986, 61-119234; May 26, 1986, 61-119233; May 26, 1986, 61-119236; May 26, 1986, 61-119219

Int. Cl.[5] H01J *5/16*

U.S. Cl. 250—227.11 **12 Claims**



1. A photoelectric device mounted in a box shaped package comprising:

a central recess formed by walls extending from a bottom wall and lid covering the recess:

an optical fiber cable passing through a fiber guard in one wall into the recess;

a plurality of first leads extending through the walls of said package, said first leads being aligned in a row and having a portion which is outside of said housing wall and a portion which is positioned in the recess for connection to leads on said photoelectric source by ultrasonic bonding;

a plurality of second leads corresponding to said first leads, each of said second leads being connected to said portion of the corresponding first lead which is outside of said housing wall by welding;

said second leads having a diameter adapted to fit into a socket and providing a first rigidity against vibration that may occur during ultrasonic bonding and at least the portions of said first leads positioned in said recess having a diameter which is greater than that of the second leads and a second rigidity against vibration that may occur during ultrasonic bonding which is greater than the first rigidity.

4,920,263

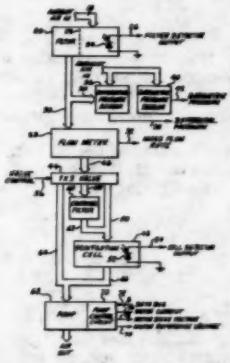
RADON DETECTION SYSTEM

Keith S. Fimian, Dana Loring; John E. McGreevy, McLean; Brian P. Fimian, Falls Church, all of Va., and Richard W. Tucker, Timonium, Md., assignors to Gemini Research, Inc., McLean, Va.

Filed Jan. 26, 1988, Ser. No. 148,729

Int. Cl.[5] G01T *1/20;* **G01V** *5/00*

U.S. Cl. 250—255 **73 Claims**



1. A radon detection system comprising:

first means for measuring an airborne radon level, said first means comprising a particulate filter for collecting at least one radon decay product, means for directing ambient air through said filter, a first detector for detecting radon decay product collected by said filter, and a second detector for detecting radon gas in the filtered air exiting form said filter;

second means for monitoring at least one additional environmental parameter other than radon level; and

recording means connected to said first and second means for recording on a common recording medium the measured radon level and the contemporanious value of said additional environmental parameter.

4,920,264

METHOD FOR PREPARING SAMPLES FOR MASS ANALYSIS BY DESORPTION FROM A FROZEN SOLUTION

Christopher H. Becker, Menlo Park, Calif., assignor to SRI International, Menlo Park, Calif.

Filed Jan. 17, 1989, Ser. No. 298,649

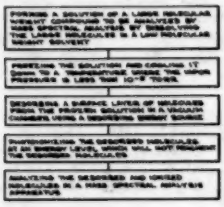
Int. Cl.[5] H01J *44/04*

U.S. Cl. 250—282 **24 Claims**

1. A method useful for preparing a sample of nonvolatile molecules for mass spectral analysis which comprises:

(a) providing a solution containing one or more types of molecules to be analyzed dissolved in a solvent selected from the class consisting of water, 1–5 carbon organic solvents, and mixtures thereof to form a solution;

(b) freezing said solution of dissolved molecules to form a frozen solution; and



(c) exposing said frozen solution to a source of laser radiation energy to desorb molecules to be analyzed from the surface of said frozen solution.

4,920,265

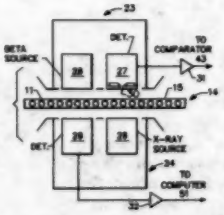
SYSTEM FOR DETERMINING THE BASIS WEIGHT OF CORD REINFORCED TIRE FABRIC

Lee M. Chase; John Goss, and Philip M. Hegland, all of Cupertino, Calif., assignors to Measurex Corporation, Cupertino, Calif.

Continuation of Ser. No. 814,384, Dec. 30, 1985, abandoned. This application Oct. 25, 1988, Ser. No. 265,314

Int. Cl.[5] G01N *23/06*

U.S. Cl. 250—308 20 Claims



1. A system for determining the weight per unit area of a sheet of material having a core comprised of spaced cords which comprises:

(a) a radiation source for irradiating an area of said sheet with radiation;

(b) first means for generating a first signal dependent on the fraction of the radiation from said radiation source which passes through said sheet;

(c) second means for providing a second signal representative of the fractional area of the material between the cords; and

(d) third means for altering said first signal by an amount dependent on the second signal.

4,920,266

CORONA GENERATING DEVICE

Louis Reale, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 27, 1989, Ser. No. 328,844

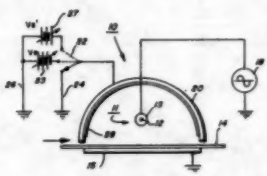
Int. Cl.[5] H01T *19/00*

U.S. Cl. 250—324 17 Claims

1. A corona generating device for depositing a negative charge on an imaging surface carried on a conductive substrate held at a reference potential comprising;

at least one elongated conductive corona discharge electrode supported between insulating end blocks,

means to connect said electrode to a corona generating potential source, at least one element adjacent said corona discharge electrode capable of adsorbing nitrogen oxide species generated when said corona discharge electrode is energized and capable of desorbing nitrogen oxide species when said electrode is not energized, said at least one element being coated with a substantially continuous thin



conductive dry film of aluminum hydroxide containing graphite and powdered nickel, said film having been formed from a liquid dispersion of aluminum hydroxide containing from about 7 to about 13 percent by weight graphite and from about 3 percent to about 10 percent by weight nickel by weight of the total weight of the dispersion.

4,920,267

METHOD OF DETECTING NOISE IN IMAGE SIGNALS

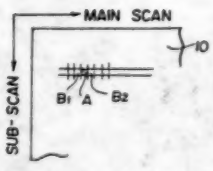
Takehumi Nagata, and Tsutomu Kimura, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 11, 1988, Ser. No. 179,821

Claims priority, application Japan, Apr. 15, 1987, 62-92757; Apr. 15, 1987, 62-92761; Apr. 15, 1987, 62-92762; Apr. 16, 1987, 62-93634

Int. Cl.[5] G01N *23/04*

U.S. Cl. 250—327.2 62 Claims



1. A method of detecting noise in image signals which are obtained by exposing a stimulable phosphor sheet carrying a radiation image stored thereon to stimulating rays, and photoelectrically detecting light emitted by the portion of the stimulable phosphor sheet exposed to the stimulating rays in proportion to the stored radiation energy by use of a photodetector, and which represent the radiation image, is detected,

the method of detecting noise in image signals comprising the steps of:

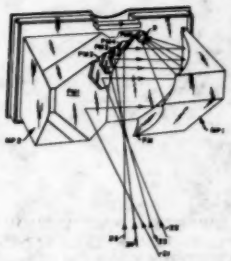
(i) comparing the image signal a at each remark picture element A with values (b1+T1), (b2+T2), ..., (bn+Tn) obtained by adding predetermined values T1, T2, Tn respectively to image signals b1, b2, ..., bn at a plurality of picture elements B1, B2, ..., Bn in the vicinity of said remark picture element A, and

(ii) recognizing that noise is contained in said image signal a in the case where said image signal a attains a value larger than every one of said values (b1+T1), (b2+T2), ..., (bn+Tn).

4,920,268
PASSIVE INFRARED DETECTION SYSTEM WITH SUBSTANTIALLY UNIFORM SENSITIVITY OVER MULTIPLE DETECTION ZONES

Robert E. Walters, Webster, and David B. Lederer, Rochester, both of N.Y., assignors to Detection Systems, Inc., Fairport, N.Y.

Filed Jan. 31, 1989, Ser. No. 304,025
Int. Cl.[5] G01J 5/08
U.S. Cl. 250—353 8 Claims



1. A passive infrared detection system comprises an infrared radiation-sensitive detector and a reflective optical system for focusing infrared radiation emanating from a plurality of detection zones onto said detector, said reflective optical system comprising a focusing element having an apparent focal length dependent upon the displacement of incident rays from the optical axis of said element, and a plurality of planar reflectors arranged at different angles with respect to such optical axis to provide the detection system with said plurality of detection zones, each zone having a different maximum detection range associated with it, said planar reflectors being arranged with respect to said focusing element so that each planar reflector cooperates with a different portion of the focusing element to project onto said detector a relatively constant size image of a given target located at the maximum range associated with that planar reflector.

4,920,269
LIQUID SCINTILLATION SOLUTION FOR MEASURING ^{222}RN IN CHARCOAL

Daniel Perlman, Arlington, Mass., assignor to Brandeis University, Waltham, Mass.

Filed Nov. 7, 1988, Ser. No. 268,172
Int. Cl.[5] G01T 1/20
U.S. Cl. 250—364 11 Claims

1. A liquid scintillation counting solution for extracting and counting radon in charcoal comprising:

a liquid scintillation counting solvent;

a light emitting fluor; and

a radon extraction solvent wherein said radon extracting solvent increases the release of radon from charcoal, wherein said extracting solvent is one of an alcohol, ketone and ether having a molecular weight of less than 100 daltons.

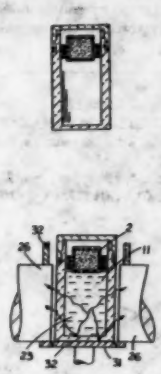
4,920,270
RADON DETECTION

Lee Grodzins, 14 Stratham Rd., Lexington, Mass. 02173

Filed Sep. 8, 1987, Ser. No. 94,192
Int. Cl.[5] G01T 1/204, 1/169
U.S. Cl. 250—364 17 Claims

1. In a method of measuring the concentration of radon in air by adsorption of radon with an adsorbent in a detector container and subsequent desorption of the radon into a liquid scintillation desorbent and measurement of the radon in the desorbent with a liquid scintillation counter, the improvement comprising:

introducing the liquid scintillation desorbent into the detector container to effect desorption of the radon from the

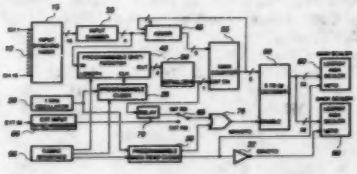


adsorbent in situ and, thereafter, without removing the adsorbent from the detector container, introducing the detector container into the liquid scintillation counter for measurement of the desorbed radon with the liquid scintillation counter.

4,920,271
MULTIPLE CHANNEL PROGRAMMABLE COINCIDENCE COUNTER

Gaetano J. Arnone, Los Alamos, N. Mex., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Feb. 27, 1989, Ser. No. 315,871
Int. Cl.[5] G01T 3/00; H01J 47/12; G06M 11/02
U.S. Cl. 250—390.01 17 Claims



1. A high speed counting circuit for accurate neutron coincidence counting comprising:

neutron detection means for supplying electrical pulses on detection of neutrons;

synchronizing means inputted by said neutron detection means for derandomizing and latching said pulses supplied by said neutron detection means:

summing means inputted by said synchronizing means for summing said pulses received during a predetermined period of time;

shift register means inputted by said summing means for shifting said sum of added pulses;

counter means inputted by said summing means for storing said sum of said pulses;

serializing means inputted by said shift register means and outputting the contents of said shift register means as a

serial stream of pulses for decrementing said sum of said pulses stored in said counter means by one pulse at a time;

decoder means inputted by said counter means after each decrement for producing an output indicative of said sum of pulses stored in said counter means after each decrement;

first scaler means inputted by said decoder means for storing said sum of pulses stored in said counter means after each decrement.

4,920,272

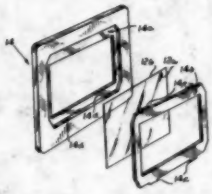
DETECTOR FOR RADON

Robert C. Yoder, Crete, Ill., assignor to Tech/Ops Landauer, Inc., Glenwood, Ill.

Filed Jun. 24, 1988, Ser. No. 211,516

Int. Cl.[5] G01T *1/08, 5/10*

U.S. Cl. 250—475.2 **10 Claims**



1. A detector for radon gas comprising: a detector member including at least two opposing detection surfaces having respective portions symmetrically exposed on respective opposite sides of the detector member and having the property of forming damage tracks along paths traversed by alpha particles impinging either of said surfaces; and support structure means for supporting and orienting said detector member with both said detection surfaces in symmetrical, simultaneous exposure to said alpha particles during use of said detector.

4,920,273

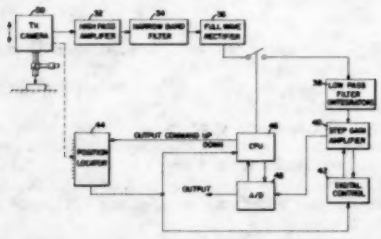
Z-AXIS MEASUREMENT SYSTEM

Jack Sacks, Thousand Oaks, and Ralph Weisner, Canoga Park, both of Calif., assignors to View Engineering, Inc., Simi Valley, Calif.

Division of Ser. No. 745,192, Jun. 17, 1985, Pat. No. 4,743,771. This application Apr. 22, 1988, Ser. No. 185,150

Int. Cl.[5] G01N *21/86*; G01V *9/04*; G01C *3/08*

U.S. Cl. 250—560 **6 Claims**



4. The method of ascertaining surface characteristics of an object comprising the steps of:

projecting a spatially distributed periodic image, from a projection source, onto the surface of the object, the image focusing at a preselected image plane from the projection source;

optically scanning the image of the surface of the object and the projected images thereon to derive a signal modulated in accordance with the periodicity of the image;

varying the position of the focal plane in a constant direction relative to the surface of the object so as to vary the modulation characteristic of the signal, thereby, causing the focal plane to transition through and beyond a maximum value of the modulation characteristics; and

identifying a predetermined modulation characteristic in the signal.

4,920,274

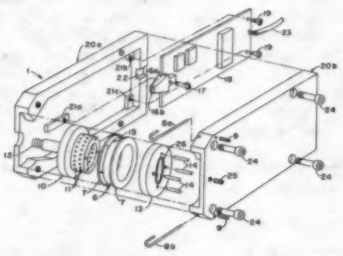
METERING APPARATUS AND METHOD FOR THE MEASUREMENT OF A FIXED LENGTH OF CONTINUOUS YARN OR STRAND

Thomas H. Jensen, Murrysville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 3, 1989, Ser. No. 331,765

Int. Cl.[5] G01N *21/86*; G01V *9/04*

U.S. Cl. 250—561 **19 Claims**



1. An apparatus for measuring strand as it is wound from a strand source onto a take-up reel comprising:

(a) means for supplying strand to the take-up reel from the strand source;

(b) an electrically controlled and appropriately powered winding means operatively connected between the strand source and the take-up reel so as to engage the strand and cause it to move in a path from the strand source and onto the take-up reel;

(c) means for guiding the advancing strand between the strand source and the take-up reel;

(d) a pressurized gas bearing positioned between the strand source and the take-up reel and with respect to the moving strand so that the strand contacts a rotatable metering rim on the pressurized gas bearing thereby causing the rim to rotate, said rim being concentrically mounted about a stationary hub, said hub having means therein for the introduction and exit of a pressurized gas so that an essentially frictionless layer of pressurized gas fills the annular region between said hub and rim thereby allowing said rim to rotate with essentially zero friction; and

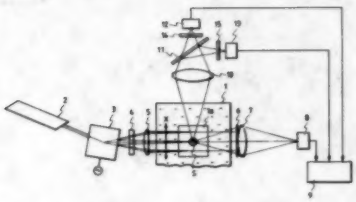
(e) a first electrical circuit means for detecting, counting, and storing the number of revolutions of the rim when it is caused to rotate.

4,920,275

PARTICLE MEASURING DEVICE WITH ELLIPTICALLY-SHAPED SCANNING BEAM

Yuji Itoh, Chigasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 30, 1988, Ser. No. 292,267
Int. Cl.[5] G01N 15/06
U.S. Cl. 250—574 13 Claims



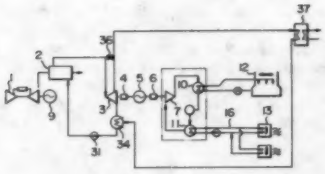
1. A particle measuring device provided with:
a light source;
scanning means for optically scanning a light from said light source in a direction intersecting the direction of passage of particles to be examined in a portion to be examined through which the particles to be examined pass;
means for making a shape of the scanning light applied to the particles to be examined into a shape longer than the length of the particles to be examined in the direction of passage of the particles to be examined; and
light receiving means for receiving the light from the portion to be examined.

4,920,276

HEAT-AND-ELECTRICITY SUPPLY SYSTEM

Akitaka Tateishi, Katsuta; Tadao Arakawa, Hitachi; Masaru Kurosawa, Nakaminato; Yoshifumi Kubo, Hitachi, and Yoji Nagai, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 4, 1988, Ser. No. 228,023
Claims priority, application Japan, Aug. 12, 1987, 62-199797
Int. Cl.[5] F01K 17/04
U.S. Cl. 290—2 13 Claims



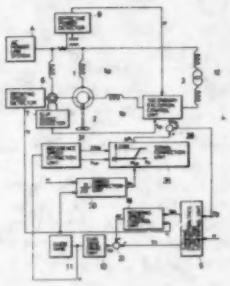
1. A heat-and-electricity supply system in which steam from a steam generator is utilized to supply an electric output and a heat output, said supply system comprising:
a steam turbine driven by the steam generated in said steam generator;
a power generator for providing the electric output, mechanically connected to said steam turbine; and
a compressor mechanically connected to said steam turbine and utilized to provide the heat output, said compressor being utilized for supplying a cooling medium to a refrigerating equipment or for supplying a heating medium to a heating equipment
wherein said steam turbine is connected to said power generator through a clutch means with reduction gear, and said power generator is connected to said compressor through a clutch means with speed increasing gear.

4,920,277

CONTROL SYSTEM FOR A VARIABLE SPEED HYDRO-POWER PLANT APPARATUS

Takao Kuwabara, Hitachi; Hiroto Nakagawa, Osaka, and Eizo Kita, Kyoto, all of Japan, assignors to Hitachi, Ltd., Tokyo and Kansai Electric Power Co., Inc., Osaka, both of, Japan

Filed Aug. 10, 1988, Ser. No. 230,434
Claims priority, application Japan, Aug. 14, 1987, 62-201712; Dec. 18, 1987, 62-318851
Int. Cl.[5] F01D 15/10
U.S. Cl. 290—40 C 19 Claims



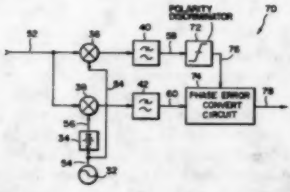
1. In a turbine mode operation of a variable speed hydro-power plant apparatus having a pump turbine (2) which exhibits a S-shaped characteristics in a turbine operation region and includes variable guide vanes (11), and a generator (1) with a frequency converter, which is so constructed as to be driven by said pump turbine (2) and to hold a frequency of a generated electric power thereof equal to a frequency of an electric power system (4) in spite of the fact that a rotating speed (N) of said pump turbine (2) is changed in conformity with an operating state, a control system for said variable speed hydro-power plant apparatus characterized in that,
upon detecting an approach of a turbine operating point of said variable speed hydro-power plant apparatus to an unstable turbine operation region, a rotating speed (N) of said pump turbine (2) is lowered.

4,920,278

PHASE COMPARATOR

Hizuru Nawata, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed May 24, 1988, Ser. No. 197,851
Claims priority, application Japan, May 26, 1987, 62-128971
Int. Cl.[5] H03K 5/00, 9/06
U.S. Cl. 307—262 4 Claims



1. A phase comparator for comparing two input signals with respect to phase in order to produce a phase difference between the two input signals, said comparator comprising:
first multiplier means supplied with a modulated signal and a reference signal which constitute the two input signals for

producing an output signal which is representative of a product of the modulation signal and the reference signal;

first low-pass filter means for filtering the output signal of said first multiplier means to produce a first output signal;

$\pi/2$ phase shifter means for shifting a phase of the reference signal by $\pi/2$ to produce a phase shifted output signal;

second multiplier means supplied with the modulated signal and the phase shifted output signal for producing an output signal which is representative of a product of the modulated signal and the phase shifted output signal;

second low-pass filter means for filtering the output signal of said second multiplier means to produce a second output signal;

polarity discriminator means supplied with one of the first and second output signals of said first low-pass filter means and said second low-pass filter means for producing a discrimination signal which is representative of a positive half and a negative half of a period of said one output signal; and

phase error converting means supplied with the other of the first and second output signals of said first low-pass filter means and said second low-pass filter means and the discrimination signal for producing a phase error signal which, when said discrimination signal is representative of the positive half, monotonously increases within one period of said other output signal which is associated with said positive half.

4,920,279

METHOD TO EXPAND AN ANALOG SIGNAL AND DEVICE TO IMPLEMENT THE METHOD

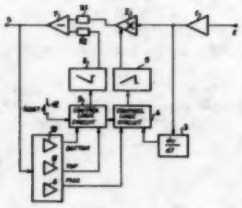
Pascal Charlet, Gardanne; Eric Lauverjat, Tours, and Rafaël Moreno, Marseille, all of France, assignors to SGS Thomson Microelectronics SA, Gentilly, France

Filed Sep. 28, 1988, Ser. No. 250,392

Claims priority, application France, Oct. 6, 1987, 87 13784

Int. Cl.[5] H03L *5/00*; H03K *5/01*

U.S. Cl. 307—264 **5 Claims**



1. A method for automatically modifying the shape of part of an analog signal for emphasizing a specifically interesting portion of the signal, said signal being successively an initial pulse followed by substantially rectangular shaped pulses having a fast rise time and a fast fall time, said method comprising multiplying each pulse of the input signal by a variable coefficient depending on the rise time of said respective pulse, for obtaining an intermediate amplified signal; and subtracting a value from the intermediate amplified signal, for obtaining an output signal, said subtracted value being constant from one pulse to another and being defined by a ramp signal starting when the output signal corresponding to said initial pulse signal reaches a first threshold and stopping when said last mentioned output signal reaches a second threshold.

4,920,280

BACK BIAS GENERATOR

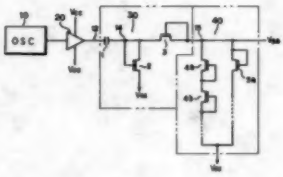
Soo-In Cho, Suwon, and Dong-Sun Min, Seoul, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Apr. 29, 1988, Ser. No. 187,930

Claims priority, application Rep. of Korea, Apr. 30, 1987, 1987-4241

Int. Cl.[5] H03L *1/00*; H03K *3/01*

U.S. Cl. 307—296.2 **20 Claims**



1. A circuit for generating a back bias voltage, to be equipped within a semiconductor memory device having a semiconductor substrate, and for providing said back bias voltage to the semiconductor substrate, said circuit comprising:

oscillator means for generating as a first output, a sequence of square waves having a specified frequency;

buffer means connectable to receive the output of said oscillator, for buffering the output of said oscillator means into a second output, square waves having an amplitude within a first range;

charge pump circuit means for receiving the output of said buffer means and for providing as a third output, a back bias voltage; and

clamping circuit means connectable between the output of said charge pump circuit means and a reference potential, for clamping with a specified range the back bias voltage being provided by said charge pump circuit in accordance with variations of a source supply voltage.

4,920,281

PROXIMITY SWITCH CIRCUIT

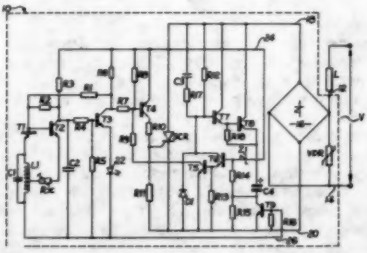
Geoffrey J. Harris, Swindon, United Kingdom, assignor to Square D Company, Palatine, Ill.

Continuation of Ser. No. 5,318, Jan. 16, 1987, abandoned, which is a continuation of Ser. No. 588,876, Feb. 11, 1984, abandoned. This application Sep. 12, 1988, Ser. No. 244,548

Claims priority, application United Kingdom, Jun. 11, 1982, 8217084

Int. Cl.[5] H01H *36/00*; H03B *5/12*

U.S. Cl. 307—308 **15 Claims**



12. A proximity switch for use with a wide range of AC supply voltages to control a load comprising:

an AC supply voltage
an induction coil;
an oscillator means connected to the coil for driving said induction coil;
a detector means connected to said oscillator for generating a detector output signal in response to proximity of a metallic object to said induction coil;
a rectifier means connected in series with said AC supply voltage and said load and to the coil, oscillator and detector means for generating a DC voltage;
a storage capacitor means connected to the oscillator means capable of being charged by the DC output voltage of said rectifier means, said storage capacitor means connected to supply operating power to said induction coil, said oscillator, and said detector;
a solid state switch connected across the output of said rectifier means and having an input responsive to said detector means output signal for switching to and "on" condition to short said DC output voltage of said rectifier means increases AC current flow through said load and removes charging current from said storage capacitor means;
a switching element connected to the storage capacitor means having an output voltage controlled by the voltage across said storage capacitor means;
an AND circuit connected to the input of said switch having a first input connected to receive said detector means output signal, having a second input to receive the output voltage of said switching element, and having an output signal connected to the input of said solid state switch to turn said solid state switch "on" when said first input is at a first predetermined voltage level and said second input is at a second predetermined voltage level, said switching element capable of changing said output voltage from a value on said second predetermined voltage level when a voltage across said storage capacitor means falls below a third predetermined voltage level, and said AND current capable of turning said solid state switch into an "off" condition in the event of a change in said output voltage of said switching element below the third predetermined voltage level; and
said AND circuit periodically turns said solid state switch "on" and "off" when said detector signal indicates the proximity of a metallic object to said induction coil, and when said solid state switch is "off" said storage capacitor means is charged, and a substantially sinusoidal current flows through said load with a first part of a cycle of said substantially sinusoidal currennt flowing through said solid state switch and a second part of said cycle of said substantially sinusoidal current flowing thru said rectifier to charge said storage capacitor means.

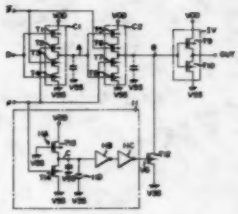
4,920,282

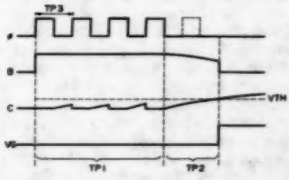
DYNAMIC LATCH CIRCUIT FOR PREVENTING SHORT-CIRCUIT CURRENT FROM FLOWING DURING ABSENCE OF CLOCK PULSES WHEN UNDER TEST

Hiroaki Muraoka, Kawasaki, and Toshiyuki Miyashita, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 20, 1988, Ser. No. 208,441
Claims priority, application Japan, Jun. 23, 1987, 62-154532
Int. Cl.[5] H03K *5/19, 19/007, 19/096*
U.S. Cl. 307—442 **17 Claims**

1. A dynamic latch circuit comprising:
a control terminal section for receiving a control clock signal formed of clock pulses which are generated at a predetermined frequency;
a plurality of register sections each for detecting a voltage of an input signal, in response to each clock pulse, generated an output signal from a capacitive output node which is charged or discharged in accordance with the voltage of the input signal and is selectively set at one of first and second potentials; and
voltage-generating means for detecting, based on a pulse interval of the control clock signal equivalent to the period of time elapsed from the trailing edge of the last generated clock pulse, that the supply of the clock pulses has been stopped, and for fixing the output nodes of said register sections at a predetermined one of said first and second potentials, upon detecting that the supply of the clock pulses has been stopped,
said voltage-generating means having timer means for detecting that said pulse interval of the control clock signal





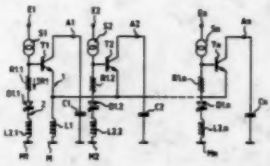
exceeds a reference period equal to an interval determined by said predetermined frequency, a power-supply terminal set at the first potential, and a plurality of switching elements connected between the power-supply terminal and the respective capacitive output nodes of said register sections, said switching elements being turned on under the control of a signal output by said timer means which it is detected that the supply of the clock pulses has been stopped.

4,920,283

HIGH SPEED, LOW NOISE INTEGRATED CIRCUIT

Werner Elmer, Moosburg, and Michael Schmitt, Freising, both of Fed. Rep. of Germany, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 16, 1988, Ser. No. 272,157
Int. Cl.[5] H03K *17/16, 19/003*
U.S. Cl. 307—443 **3 Claims**



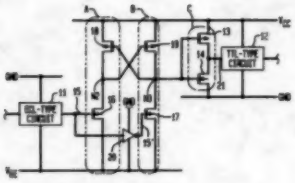
1. Integrated circuit comprising a plurality of output transistors for emitting binary signals to associated output terminals and having at least one ground terminal, characterized in that between a base of each output transistor and the at least one ground terminal a current source controlled by a base voltage is inserted.

4,920,284

CMOS LEVEL CONVERTER CIRCUIT WITH REDUCED POWER CONSUMPTION

Akira Denda, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 24, 1988, Ser. No. 261,634
Claims priority, application Japan, Oct. 22, 1987, 62-267794
Int. Cl.[5] H03K *19/092;* **H03L** *5/00*
U.S. Cl. 307—475 **10 Claims**



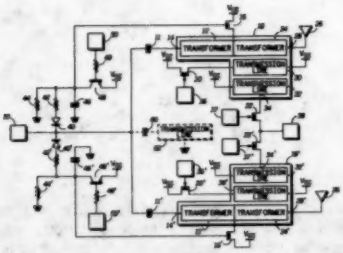
1. A level converter circuit comprising: a first MOS transistor of one conductivity type connected between a first potential power line receiving a first potential of a first polarity and a first node and having a gate receiving a first signal having an amplitude between said first potential and a ground potential, a second MOS transistor of said one conductivity type connected between said first potential power line and a second node and having a gate receiving a second signal having an opposite phase to said first signal, a third MOS transistor of an opposite conductivity type connected between said first node and a second potential power line receiving a second potential of a second polarity opposite to said first polarity and having a gate coupled to said second node, a fourth MOS transistor of said opposite conductivity type connected between said second potential power line and said second node and having a gate coupled to said first node, a fifth MOS transistor of said opposite conductivity type connected between said second potential power line and a third node and having a gate coupled to said second node, and a sixth MOS transistor of said one conductivity type connected between a ground potential line receiving said ground potential and said third node and having a gate coupled to said second node, wherein a third signal obtained by converting said first signal and having an amplitude between said second potential and said ground potential is generated from said third node.

4,920,285

GALLIUM ARSENIDE ANTENNA SWITCH

Edward T. Clark, Plantation, and Enrique Ferrer, Miami, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 21, 1988, Ser. No. 274,167
Int. Cl.[5] H03K *17/687;* **G06G** *7/28;* **H02J** *17/00*
U.S. Cl. 307—571 **12 Claims**



1. A method of switching a radio frequency signal being capable of representation by a voltage component and a current component the product of which approximates a signal power, said method comprising the steps of:

(a) processing the radio frequency signal to provide a processed signal by decreasing said voltage component and increasing said current component, such that the signal power of said processed signal remains substantially identical to said radio frequency signal; and,

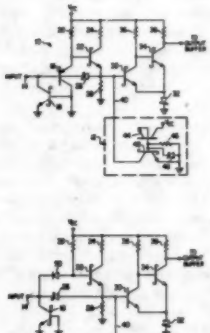
(b) coupling said processed signal to a radio frequency ground when switching the radio frequency signal to the radio frequency ground, and converting said processed signal to provide an output signal by increasing said voltage component and decreasing said current component, such that said output signal is substantially identical to said radio frequency signal, when switching the radio frequency signal to an output port.

4,920,286

METHOD AND CIRCUITRY FOR COMPENSATING FOR NEGATIVE INTERNAL GROUND VOLTAGE GLITCHES

Janet L. Wise, and Steven E. Marum, both of Sherman, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 2, 1986, Ser. No. 881,146
Int. Cl.[5] H03K *19/003, 19/088, 17/16, 17/60*
U.S. Cl. 307—542 **9 Claims**



1. Circuitry for compensating for internal ground voltage fluctuations comprising:

an output transistor having a base for receiving input signals, said output transistor also including a first electrode for generating output signals and a second electrode coupled to internal ground;

a compensation transistor coupled at its collector to said base of said output transistor and at its emitter to internal ground; and

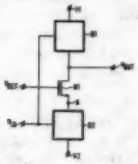
a supply transistor having a collector connected to receive supply voltage and a shorted emitter-base connected to said base of said compensation transistor for supplying current to the base of said compensation transistor, said compensation transistor being rendered conductive by the occurrence of negative voltage fluctuations on internal ground.

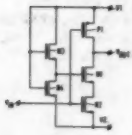
4,920,287

OUTPUT BUFFER HAVING REDUCED ELECTRIC FIELD DEGRADATION

Cornelis D. Hartgring, Dublin, Ireland; Jan Dikken, and Tiemen Poorter, both of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Filed Nov. 1, 1988, Ser. No. 265,660
Claims priority, application Netherlands, Nov. 4, 1987, 8702630
Int. Cl.[5] H03K 17/04, 17/06, 17/687, 19/003
U.S. Cl. 307—542 5 Claims





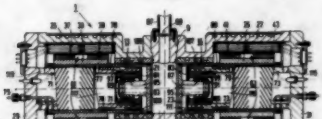
1. An integrated digital circuit, comprising a first MOS transistor of a first conductivity type whose drain is coupled to an output terminal and being coupled to a first power supply terminal by a first means, its gate being connected to a first input terminal and its source being coupled to a second power supply terminal by a second means, said second means comprising at least one second MOS transistor of the first conductivity type, the first and the second means being driven by a second input terminal, and means for suppressing "hot carrier stress" by at least one of providing the first transistor with a threshold voltage which is higher than that of the second transistor and providing the first transistor with a channel length which is greater than that of the second transistor.

4,920,288

PISTON ENGINE WITH DYNAMIC GROOVE BEARING EXTERNAL TO PISTON AND ISOLATED FROM COMPRESSION SPACE

Ronald den Heijer; Godefridus C. Goverde, both of Eindhoven, and Peter G. M. Simons, Best, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 28, 1989, Ser. No. 329,750
Claims priority, application Netherlands, May 19, 1988, 8801293
Int. Cl.[5] H02K 33/00; F16C 31/00
U.S. Cl. 310—15 24 Claims



1. A piston engine comprising a circular cylinder, a piston that is reciprocable in said cylinder for working on a gaseous medium present in said cylinder during engine operation, and means for reciprocating said piston in said cylinder, the improvement comprising:

said piston being tubular and having an inner and outer wall surface of circular cross-section, said piston being open at one end and having a transverse end face at the opposite end,

said engine having a compression space opposite said piston end face into which said gaseous medium is compressed during piston reciprocation,

an elongate circular-cylindrical guide concentric with said cylinder having an outer surface, and extending into said piston through said open end,

said outer surface of said guide and said inner wall surface of said piston comprising a dynamic groove bearing for centering said piston in said cylinder during reciprocation of said piston, and

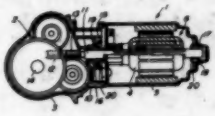
said piston being sized near said end face for forming a sealing gap with said cylinder, whereby said dynamic groove bearing is isolated from said compression space by said sealing gap.

4,920,289

BEARING HOLDER WITH RESILIENT RETAINING PAWLS

Yasujiro Saito, Yokohama, Japan, assignor to Jidosha Denki Kogyo Kabushiki Kaisha, Kanagawa, Japan

Filed Jan. 3, 1989, Ser. No. 292,970
Claims priority, application Japan, Jan. 12, 1988, 63-1683[U]
Int. Cl.[5] H02K 5/16
U.S. Cl. 310—90 3 Claims



1. A bearing holder for securing a bearing in a bearing fixed part provided in a through hole of a gear case, comprising:

an annular member including a plurality of pawls disposed in an outer circumference of said annular member and extending radially outwardly therefrom;

a bearing contact portion disposed along an inner circumference of said annular member for contacting said bearing; and

a plurality of guide planes disposed on the outer circumference of said annular member and extending axially with respect to said annular member for securing said annular member to said fixed part and a plurality of slots disposed proximate said pawls for maintaining a spring force of said bearing holder against said first part.

4,920,290

ACTIVE MAGNETIC BEARING APPARATUS

Chikara Murakami; Atsushi Nakajima; Hirokuni Hiyama, all of Tokyo; Satoshi Inanaga, and Katsuhide Watanabe, both of Kanagawa, all of Japan, assignors to National Aerospace Laboratory, Chofu and Ebara Research Co., Ltd., Fujisawa, both of, Japan

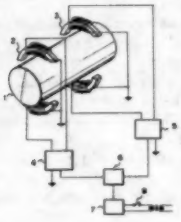
Filed Nov. 1, 1988, Ser. No. 265,726
Int. Cl.[5] F16C 39/06
U.S. Cl. 310—90.5 5 Claims

1. An active magnetic bearing apparatus, comprising:

a plurality of active magnetic bearings for rotatably supporting a rotational shaft;

a sensor means for generating position signals corresponding to a detected angular position of said rotational shaft;

electrical control means for suspending said rotational shaft in a non-contact state by altering the amperage of current to be supplied to said bearings in response to a position



signal transmitted from said sensor means and controlling the magnetic force of said magnetic bearings; and

a delay control means for reducing the starting-up current for a magnetic bearing assembly by sequentially supplying a starting-up current to the respective magnetic bearings with a slight interval between the supply of current to each magnetic bearing.

4,920,291

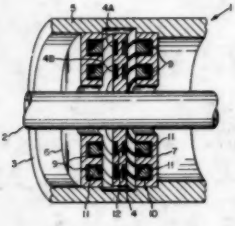
MAGNETIC THRUST BEARING WITH HIGH FORCE MODULATION CAPABILITY

Lloyd W. McSparran, Pittsburgh, Pa., assignor to Contraves Goerz Corporation, Pittsburgh, Pa.

Filed Jan. 19, 1989, Ser. No. 299,882

Int. Cl.[5] F16C *39/06*

U.S. Cl. 310—90.5 **14 Claims**



1. In an electromagnetic axial thrust bearing comprising

a rotating member for turning about an axis,

at least one stationary member fixed relative to the axis of the rotating member,

means for generating a m.m.f. associated with said stationary member,

said rotating member and stationary member having adjacent faces in close proximity,

said rotating member, stationary member, and m.m.f. generating means arranged so that the path of magnetic flux resulting from said m.m.f. generating means passes from the stationary member to the rotating member and back, magnetic flux lines passing between the stationary member and rotating member having a component in the axial direction resulting in a magnetic attraction between the members that produces a restraining thrust force,

the improvement comprising:

said stationary member comprised of a solid ferromagnetic material having at least one of arc-shaped grooves substantially concentric with the turning axis of the rotating member, said groove being lined with laminates of a ferromagnetic material thus defining a lined groove, said groove being defined by two sides and a bottom, the long axes of laminates at the bottom of the groove being substantially in the radial and circumferential directions and the long axes of laminates at the sides of the groove being substantially in the axial and circumferential directions,

said m.m.f. generating means comprising a coil laid into the lined groove of the stationary member, and

said rotating member having a groove facing the groove in the stationary member, said groove in the rotating member having laminates of ferromagnetic material stacked therein, the long axes of the laminates in the groove on the face of the rotating member being substantially in the radial and circumferential directions.

4,920,292

MOTOR HAVING ROTOR CAPABLE OF BOTH STEPPED ROTARY AND AXIAL SHIFT MOTIONS

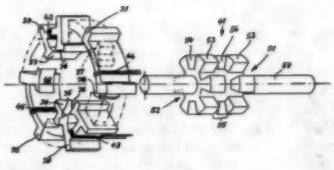
Klaus Albrecht, Königsfeld; Helmut Hans, St. Georgen; Johann von der Heide, Schramberg, and Fritz Schmider, Hornberg, all of Fed. Rep. of Germany, assignors to Papst-Motoren GmbH & Co. KG, Black Forest, Fed. Rep. of Germany

Filed Aug. 28, 1987, Ser. No. 90,743

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1986, 3629377

Int. Cl.[5] H02K *16/02*

U.S. Cl. 310—114 **42 Claims**



1. An electric motor having a rotor with salient poles, a stator and an exciter system with a winding having coils which are selectively energized to impart step-by-step rotary motion to the rotor, the rotor and stator being supported to move in an axial direction with respect to one another, the exciter system including a first exciter imparting step-by-step rotary movement to the rotor, and a second exciter imparting relative axial movement within a zone to the rotor, both of these exciters being capable of being energized independently of one another, said first exciter having an air-core type multicoil winding generally formed in a cylindrical shape and encompassed within a ferromagnetic envelope, whose individual coils are adjacent one another in the direction of rotor rotation, each coil being generally hexagonal in shape with two of the parallel legs being longer than the other four, the two parallel long legs of the hexagonal extending generally parallel to the motor axis and generally coextensive with the zone of axial motor movement.

4,920,293

SQUIRREL-CAGE INDUCTION MOTOR

Akio Kanda, Nagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 9, 1988, Ser. No. 282,267

Claims priority, application Japan, Dec. 10, 1987, 62-311074

Int. Cl.[5] H02K *17/00*

U.S. Cl. 310—116 **5 Claims**

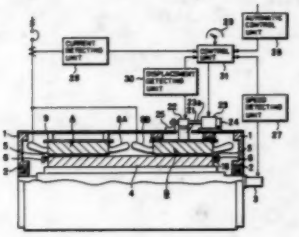
1. A squirrel-cage induction motor comprising;

a frame;

a squirrel-cage rotor rotatably supported on the frame;

a first stator disposed around the squirrel-cage rotor within the frame and fixedly held on the frame; and

a second stator having the same number of poles and slots as the first stator circumferentially movably within an angular range corresponding to one pole pitch of magnetic pole disposed around the squirrel-cage rotor within the frame beside the first stator with respect to the axial direction, stator being interlocked with a control motor through a gear mechanism including a segmental worm



gear provided fixedly on the circumference of said second stator, and a worm meshing with the segmental worm gear is fixed to the output shaft of said control motor, and a control unit determines the direction and amount of angular displacement of the second stator on the basis of operating conditions required by the load and controls said control motor so as to turn the second stator accordingly.

4,920,294

SYNCHRONOUS OR STEPPING MOTOR WITH SIMPLIFIED TOOTH ALIGNMENT

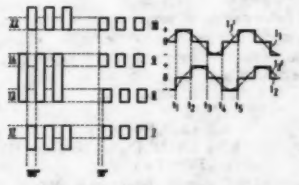
Aloïs E. Christiaens, Liedekerke, and Leon G. G. Lebon, Waterloo, both of Belgium, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 212,133, Jun. 27, 1988, abandoned, which is a continuation of Ser. No. 894,438, Jul. 30, 1986, abandoned, which is a continuation of Ser. No. 672,023, Nov. 16, 1984, abandoned. This application May 30, 1989, Ser. No. 361,787

Claims priority, application Netherlands, Aug. 20, 1984, 8402542

Int. Cl.[5] H02K *37/12*

U.S. Cl. 310—162 **26 Claims**



1. An electric motor, comprising:

two coaxial stator sections which are magnetically interconnected, each section having two sets of coaxially arranged stator teeth, at least one coaxial annular coil, and a magnetically conductive circuit extending between the respective sets of stator teeth of said section, and

a rotor, mounted for rotation coaxially within said stator sections about an axis, and comprising two axially spaced coaxial rotor sections having an axially magnetized permanent magnet disposed therebetween, each rotor section having an outer circumference having a plurality of rotor teeth spaced by air gaps from the stator teeth of a respective stator section,

each rotor section and respective stator section further comprising magnetically conductive members forming a magnetically conductive circuit which surrounds the respective at least one annular coil and includes the air gaps between the respecive rotor teeth and stator teeth of that rotor and stator section,

characterized in that a respective one of the two sets of stator teeth of each of the two stator sections are axially adjacent and have their teeth aligned exactly in line with each other, the other set of stator teeth of each respective section has its teeth offset one-half tooth pitch from said one sets, whereby said other sets of stator teeth are aligned with each other, the rotor teeth of a respective rotor section, spaced by air gaps from a corresponding stator section, are aligned with each other, and the teeth of one rotor section are offset one quarter tooth pitch with respect to the teeth of the other rotor section.

4,920,295

ALTERNATOR

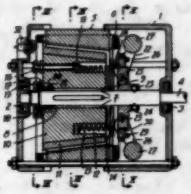
Karel Holden, and Ladislava Holdenova, both of Bleekhofstraat 27, 2018 Antwerp, Belgium

Filed Aug. 10, 1988, Ser. No. 230,534

Claims priority, application Belgium, Aug. 10, 1987, 08700892

Int. Cl.[5] H02K *23/44*

U.S. Cl. 310—209 **3 Claims**

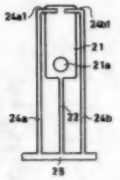


1. Alternator, comprising in combination a housing, a hollow stator with windings fixed in said housing and having a conical inner shell, an axial rotary shaft in said housing, a rotor with a conical outer shell on said shaft and operating in conjunction with the conical inner shell of said stator, a slide between the shaft and the rotor for the axial motion of said rotor over the shaft and in said stator for the current control, a disc mounted on said shaft and dispersed near one end of said rotor, a compression spring for sliding said rotor over the shaft into said stator and arranged between said rotor and disc, a thrust plate movable over the shaft and disposed near the other end of said rotor, a thrust ring arranged around said shaft, a compression spring for sliding said rotor over the shaft out of the stator and arranged between said thrust plate and thrust ring, setting bolts working in conjunction with said thrust ring for the adjustment of the compression of said compression spring, and a centrifugal voltage controller for fine-adjusting the compression of said compression spring sliding said rotor out of the stator and keeping the induced current voltage the same, said controller fixed on said shaft and having swivel arms with weights to exert a pressure on the adjacent thrust plate and compression spring.

4,920,296
ELECTRONIC COMPONENT HAVING A PLATE-SHAPED ELEMENT

Hiroyuki Takahashi; Takashi Yamamoto, and Takeo Nakadachi, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Continuation of Ser. No. 273,109, Nov. 16, 1988, abandoned, which is a continuation of Ser. No. 787,421, Oct. 15, 1985, abandoned. This application Aug. 2, 1989, Ser. No. 388,764
Claims priority, application Japan, Oct. 17, 1984, 59-219285
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—348 15 Claims



1. A piezoelectric component, comprising:

a plate-shaped element which includes a piezoelectric substrate having a right side portion and a left side portion divided by a slit formed from a top end to a middle portion of said substrate in a longitudinal direction of said substrate, respective pairs of vibrating electrodes formed on front surfaces of said right side portion and said left side portion, respective common electrodes formed on rear surfaces of said right side portion and said left side portion so as to oppose said pairs of vibration electrodes, respectively, first connecting electrodes each respectively extended from one electrode of each of said respective pairs vibration electrodes to said top ends of said right side portion and said left side portion, and a second connecting electrode formed on a rear surface of said substrate and extended from said respective common electrodes to a bottom end of said substrate;

a metal plate which is formed with substantially the same shape and substantially the same surface area as said substrate so as to receive said plate-shaped element on a first main surface thereof, on said first main surface of which said rear surface of said substrate is placed, said metal plate having a through-hole which is formed at a position associated with said second connecting electrode;

a conductive connecting member for interconnecting said second connecting electrode and said first main surface of said metal plate through said through-hole on said metal plate;

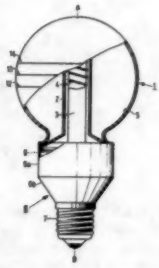
a first lead terminal integral with and extending from said metal plate; and

second terminals conductively connected to each of said first connecting electrodes, respectively, each of said second lead terminals having a bent tip portion which is conductively connected to each of said first connecting electrodes such that said second lead terminals can extend in the same extending direction as said first lead terminal and in parallel with both side edges of said substrate, respectively.

4,920,297
ELECTRIC LAMP

Johannes M. A. van der Heijden; Pierre L. L. M. Derks, both of Eindhoven, and Cornelis Pensing, Oss, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 43,902, Apr. 29, 1987, abandoned. This application Dec. 21, 1988, Ser. No. 353,201
Claims priority, application Netherlands, Apr. 29, 1986, 8601092; Sep. 22, 1986, 8602378
Int. Cl.[5] H01J *7/00*
U.S. Cl. 313—315 14 Claims



1. An electric lamp, comprising:

(a) a lamp cap;

(b) an outer envelope defining a lamp axis;

(c) a light source arranged within said outer envelope energizable for emitting light;

(d) a base shell comprising synthetic material having a first end connected to said lamp cap and a tubular portion having an inner surface defining a second end for receiving said outer envelope; and

(e) means for securing said outer envelope to said base shell comprising said tubular portion having a plurality of ribs on said inner surface substantially aligned with said lamp axis, a plurality of resilient tongues each secured to said outer envelope and having a barbed portion, and means for securing each tongue to said outer envelope, each of said tongues being positioned such that each barbed portion is resiliently biased against a corresponding rib, and said biased barbed portions being oriented with respect to said ribs such that each barbed portion is anchored against a corresponding rib to prevent translation of said tongues and said outer envelope away from said lamp cap and for slidably engaging a corresponding rib for allowing axial translation of said tongues and said outer envelope in the direction of said lamp cap.

4,920,298
FLAT FLUORESCENT LAMP FOR LIQUID CRYSTAL DISPLAY

Katsuhiro Hinotani, Shijonawate; Shunichi Kishimoto, Kaizuka; Haruhisa Kosaka, Nara; Katsumi Terada, Hirakata, and Goro Hamagishi, Toyonaka, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Mar. 18, 1988, Ser. No. 169,708
Claims priority, application Japan, Mar. 20, 1987, 62-66614; Mar. 20, 1987, 62-66616; Mar. 20, 1987, 62-66617; Mar. 20, 1987, 62-66618
The portion of the term of this patent subsequent to Aug. 30, 2005, has been disclaimed.
Int. Cl.[5] H01J *61/35, 61/42;* G02F *1/13*
U.S. Cl. 313—493 17 Claims

1. A flat fluorescent lamp for a liquid crystal panel comprising:

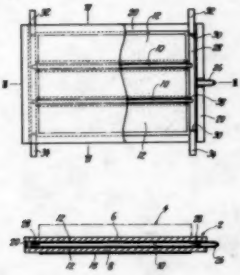
a rectangular lower glass plate coated with a fluorescent film on an inner surface thereof;

a rectangular lower glass plate coated with a fluorescent film on an inner surface thereof and disposed above the lower glass plate;

a glass side wall disposed along peripheral edges of the upper and lower glass plates and having upper and lower end faces thereof hermetically joined to the peripheral edges of the glass plates to form a hermetic discharge space between the upper and lower glass plates;

a pair of discharge electrodes arranged in parallel within the discharge space and opposed to each other; and

at least one reinforcing glass member disposed between the electrodes and for supporting the upper and lower glass



plates, the reinforcing glass member having a height approximately equal to the distance between the upper and lower glass plates, wherein an inner surface of the upper glass plate has an uncoated portion having no fluorescent film at a position where the reinforcing glass member is in contact with the inner surface and further wherein the inner surface of the lower glass plate has an uncoated portion without any fluorescent film at a position where the reinforcing member is in contact with the inner surface, the lower glass plate is provided on a lower surface thereof with a reflecting film positioned corresponding to the uncoated portion thereof.

4,920,299

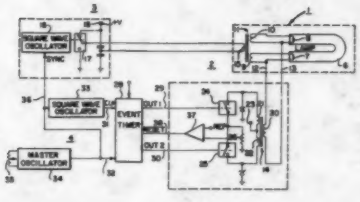
PUSH-PULL FLUORESCENT DIMMING CIRCUIT

Michael Presz, Dracut, and Guy Dela Rosa, Newton, both of Mass., assignors to General Electric Company, Burlington, Mass.

Filed Apr. 27, 1988, Ser. No. 188,588

Int. Cl.[5] H05B *41/14*

U.S. Cl. 315—98 **5 Claims**



1. Variable arc-voltage power supply circuitry for a fluorescent lamp light source comprising:

(a) fluorescent lamp means having a plurality of filament electrodes,

(b) a filament current supply source coupled to and heating said lamp filaments,

(c) a push-pull DC arc voltage supply for alternately producing arc supply voltage pulses of opposite polarity including switch means coupled between a DC supply and the primary winding of a transformer the secondary winding of which is coupled to said electrodes; said switch means being opened and closed to permit current flow in one direction to generate a voltage pulse of one polarity in said secondary winding and alternately opened and closed to permit current flow in the opposite direction to generate a voltage pulse of the opposite polarity,

(d) means for coupling said pulses to said lamp electrodes whereby each of said filament electrodes alternately operates as an anode and as a cathode, whereby both filament electrodes are subject to even wear,

(e) dimming means for said lamp means including means for varying the duty cycle of the output pulses from said arc voltage supply to vary lamp brightness.

4,920,300

POWER SUPPLY

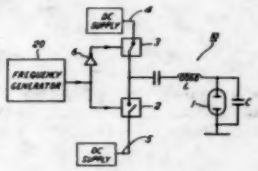
Mark A. Scott, Yiewsley, England, assignor to Thorn EMI plc, London, England

Filed May 11, 1988, Ser. No. 192,636

Claims priority, application United Kingdom, May 12, 1987, 8711131

Int. Cl.[5] H05B *41/24*

U.S. Cl. 315—209 R **10 Claims**



1. A power supply suitable for an arc discharge lamp, the power supply comprising a drive circuit arranged to supply voltage to the lamp and control means for causing a characteristic of said voltage to vary, with time, in accordance with a pseudo-random sequence in order to reduce, or eliminate, acoustic resonance in the lamp.

4,920,301

CAPACITOR DISCHARGE STROBE LIGHT

James M. Crooks, P.O Box 131, Verona, Wis. 53593

Continuation-in-part of Ser. No. 927,337, Nov. 6, 1986, abandoned. This application Nov. 15, 1988, Ser. No. 271,500

Int. Cl.[5] F21Q *3/00*; H05B *41/30, 41/34*

U.S. Cl. 315—241 S **25 Claims**

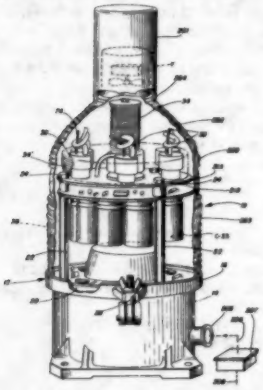
1. A capacitor discharge and strobe light beacon system for an incandescent tower light fixture of the type having a cylindrical open ended base to which AC power is supplied and a generally cylindrical high quality glass Fresnel lens which is removably attached to close the open end of the base, comprising:

HVDC means for producing a rectified high voltage, said HVDC means having input terminals for receiving the AC power supplied to the base of the light fixture and having HV output terminals for an output voltage;

first energy storage means for receiving high voltage from said HVDC means and capacitively storing energy therein across two terminals of which one is connected to one end of choke means;

load means for producing light from at least two discharge lamps which are connected to be operated redundantly and simultaneously, each lamp having an anode terminal connected to the other end of said choke means, having a cathode terminal connected to the other of said two terminals of said energy storage means, and having triggering means for discharging said energy storage means through said lamps upon receiving a triggering signal;

circuit control means for operating a switch to apply said triggering signal to said lamps from said energy storage means after AC power has been applied to said HVDC means for a predetermined time interval; and



mounting means, carried by the base of the incandescent light fixture and fitting within the Fresnel lens, for mounting said energy storage means and said lamps, said lamps being removably located at a spaced distance from the longitudinal axis of the Fresnel lens.

4,920,302

FLUORESCENT LAMP POWER SUPPLY

John G. Konopka, Ingleside, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Continuation of Ser. No. 7,231, Jan. 27, 1987, abandoned. This application Apr. 11, 1988, Ser. No. 177,798

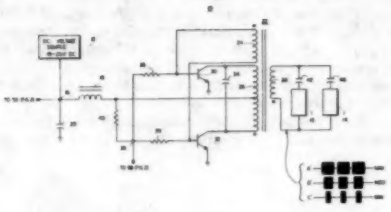
Int. Cl.[5] H05B *37/02*

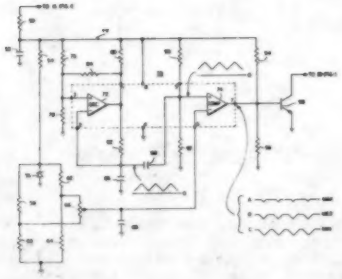
U.S. Cl. 315—307 **8 Claims**

1. A power supply for a fluorescent lamp comprising:

generating means for developing a high frequency voltage for supplying high frequency energy to a fluorescent lamp;

switching means, comprising pulse width modulation means, operating at a lower frequency than said high frequency, for periodically interrupting the supply of said high frequency energy to provide bursts of said high frequency energy at said lower frequency rate; and





control means for controlling said switching means to control the brightness of said fluorescent lamp by controlling the duration of said bursts of said high frequency energy.

4,920,303

DEVICE FOR ROTARY-DRIVING A CENTRIFUGE ARM AND METHOD FOR POWER-FEEDING SAID DEVICE

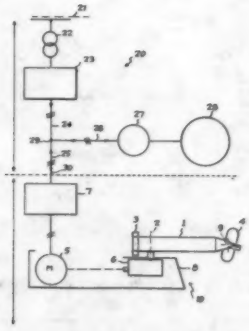
Jacques Perdriat, Maule, France, assignor to Acutronic France, Les Clayes-Sous-Bois, France

Filed Apr. 5, 1989, Ser. No. 334,201

Claims priority, application France, Apr. 11, 1988, 88 04774

Int. Cl.[5] H02K *7/02*

U.S. Cl. 318—161 **14 Claims**



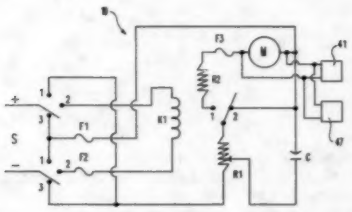
1. A device for rotary driving a centrifuge arm, comprising:

a high power electric motor for driving the centrifuge arm;

an electric power supply source having an average voltage multiphase supply network, wherein the network

provides less power to the motor than the theoretical power required by the motor;
a multiphase voltage step-down transformer connected to said network;
a multiphase rotary machine;
a first static device for controlling said rotary machine, said first static device having a multiphase input connected to the secondary winding of the step-down transformer, a multiphase output connected to a node of electric linkages, and the rotary machine is electrically connected to said node;
a high capacity inertia flywheel mechanically coupled to said rotary machine;
output terminals connected to said node;
a second static device connected between the output terminals and the high power electric motor for controlling the high power electric motor.

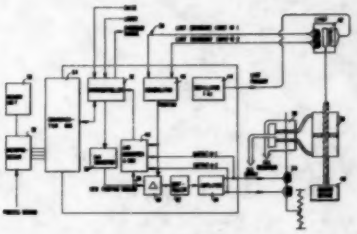
4,920,304
VENT ACTUATOR
Frank P. Antonowitz, 1 Sea Esta Pl., Ventura, Calif. 93003
Filed Jun. 7, 1989, Ser. No. 362,523
Int. Cl.[5] B60J *7/08*
U.S. Cl. 318—466 **17 Claims**



1. In a vent actuator mechanism for opening a vent, the improvement comprising:
a DC permanent magnet motor;
a capacitor having a first terminal connected to a first armature contact on said motor;
a variable resistor having a first terminal connected to a second terminal of said capacitor;
a relay for connecting a second terminal of said resistor to a second armature contact of said motor when said relay is energized and for connecting said second resistor terminal to said first capacitor terminal when said relay is de-energized; and
a three position switch having a first position for charging said capacitor in a first polarity, a second position for charging said capacitor to an opposite polarity and a third position for energizing said relay to discharge said capacitor through said motor.

11. An actuator for opening a vent in a vehicle, comprising:
a guide track adapted for mounting adjacent said vent;
a slider mounted for reciprocal linear movement along said guide track;
an actuating arm having a first end pivotally mounted to said slider and a second end adapted for pivotal connection to said vent;
a pair of pulleys mounted at opposite ends of said guide tracks;
a flexible endless drive member supported by said pulley;
means securing said slider to said endless drive member;
motor means for selectively rotating one of said pulleys in opposite directions; and
an electromagnetically actuated clamping mechanism for securing said actuating arm in an adjusted position.

4,920,305
AUTO CALIBRATING ELECTRO HYDRAULIC SERVO DRIVER
Richard E. Benson, Mentor, Ohio; Andrew D. Gavrilos, New Kensington, Pa.; Robert S. Rand, Painesville, Ohio; Scott M. Shaw, Allison Park, Pa.; Joel W. Spafford, Cleveland, Ohio, and Ronald J. Walko, Ford City, Pa., assignors to The Babcock & Wilcox Company, New Orleans, La.
Continuation of Ser. No. 62,279, Jun. 12, 1987, abandoned. This application Feb. 8, 1989, Ser. No. 308,989
Int. Cl.[5] G05B *3/20*
U.S. Cl. 318—657 **3 Claims**



1. An electro-hydraulic servo system having automatic calibration capabilities and having the ability to move a driven device toward a desired position for the driven device comprising:
means for determining % position demand of the driven device;
microcontroller **32** for actuating the driven device through an automatic calibration sequence by ramping the driven device to its 100% mechanical limit P_{100} and it 0% mechanical limit P_0 to obtain calibration data for the driven device, a microprocessor connected responsive to said calibration data from said microcontroller; and
non-volitile memory means **56** connected to said microprocessor for storing said calibration data received by said microprocessor, said microprocessor accessing said calibration data from said memory means and calculating the desired position of the driven device from said calibration data and said % position demand according to the following equation:

$$\text{[New Position Demand] Desired Position} = \frac{(\%\text{ position demand})\,(P_{100} - P_0) + P_0}{100}.$$

4,920,306
METHOD FOR CONTROLLING THE TORQUE OF A SYNCHRONOUS MACHINE SUPPLIED BY A FREQUENCY CONVERTER
Matti Mard, Kauniainen; Vesa Vaahkonen, Helsinki, and Olavi Kangasaho, Kauniainen, all of Finland, assignors to ABB Stromberg Drives OY, Helsinki, Finland
Filed Aug. 3, 1988, Ser. No. 227,775
Claims priority, application Finland, Aug. 7, 1987, 873433
Int. Cl.[5] H02P *5/40*
U.S. Cl. 318—722 **7 Claims**

1. A method for controlling the torque of a synchronous machine supplied by a frequency converter and having a rotor winding with separately controlled excitation current, wherein starting from measured variables (i_R, i_S, i_T, i_f) representing the state of the machine, the direct axis flux component (ψ_d), the quadrature axis flux component (ψ_q) and the pole angle (δ) for the machine are determined, and set values are produced for

the flux (ψ set value), excitation current (i_{f0} set value) and current building the torque (i_2 set value), comprising the steps of:

forming from the calculated pole angle (δ) by means of a limiting block a limited pole angle (δ_r) that equals the pole angle (δ) if the pole angle has an absolute value smaller than a separately adjustable limit (δ_{max}), but equals the limit (δ_{max}) if the pole angle has an absolute value equal to or greater than the limit (δ_{max});

projecting the set value (i_2 set value) of the current controlling the torque, being perpendicular to the direction forming the limited pole angle (δ_r) with the direct axis (d) of the rotor, as the set value for the direct axis stator current (i_{d0} set value) and as the set value for the quadrature axis stator current (i_{q0} set value); and

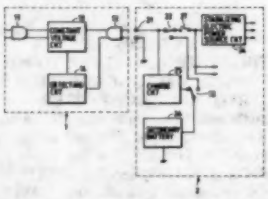
calculating in order to maintain the direct flux (ψ_d) at a value corresponding to the limited pole angle (δ_r) and the flux set value (ψ set value), the set value for the excitation current (i_{f0} set value) on the basis of the limited pole angle (δ_r), the flux set value (ψ set value) and the set value for the direct stator current (i_{d0} set value) so that the set value for the excitation current (i_{f0} set value) compensates for the direct stator set value (i_{d0} set value).

4,920,307

ELECTRIC POWER SOURCE USED TO CHARGE A SECONDARY POWER SOURCE

Kohei Iketani, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 12, 1989, Ser. No. 378,874
Claims priority, application Japan, Jul. 19, 1988, 63-179750
Int. Cl.[5] H02J 7/00
U.S. Cl. 320—28 **8 Claims**



1. An electric power source for supplying a direct current voltage to electronic equipment having a battery which is charged by said electric power source, said electric power source comprising:

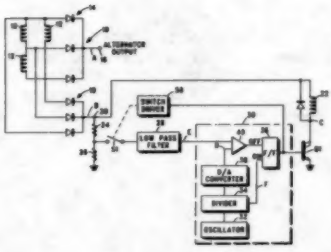
first means for detecting an electric current supplied to the electronic equipment from said electric power source; and second means for adjusting an output voltage of said electric power source to one of at least two different voltages in accordance with the amount of said detected current.

4,920,308

REGULATOR FOR AUTOMOTIVE CHARGING SYSTEMS

Arthur J. Edwards, Hoffman Estates, Ill., and Randall C. Gray, Tempe, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 3, 1989, Ser. No. 332,125
Int. Cl.[5] H02J 7/14; H02K 11/00
U.S. Cl. 322—58 **5 Claims**



1. In a vehicle charging system that includes: (a) an alternator with a field winding that is excited by a regulator, and a diode trio providing an output from the alternator, and (b) a regulator with a filter for filtering the output of the diode trio and with circuitry for turning off and turning on the excitation to the field winding, a method for rendering the regulator relatively insensitive to voltage steps induced in the output of the diode tri by the turn-on and turn-off of the field excitation, comprising:

sensing the turn-off and turn-on of the field excitation;

disconnecting the filter from the diode trio responsive to the field excitation being turned off; and

connecting the filter to the diode trio responsive to the field excitation being turned on.

4,920,309

ERROR AMPLIFIER FOR USE WITH PARALLEL OPERATED AUTONOMOUS CURRENT OR VOLTAGE REGULATORS USING TRANSCONDUCTANCE TYPE POWER AMPLIFIERS

Tamas S. Szepesi, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

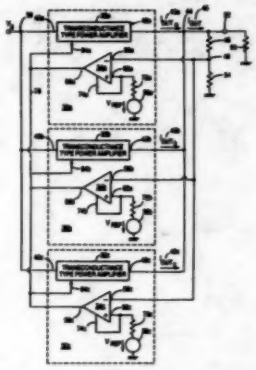
Filed Mar. 24, 1989, Ser. No. 328,166
Int. Cl.[5] G05F 1/46; H02M 3/158
U.S. Cl. 323—269 **11 Claims**

1. An error amplifier system for use with a transconductance type power amplifier comprising:

a. a plurality of error amplifiers, each of said error amplifiers having an output means;

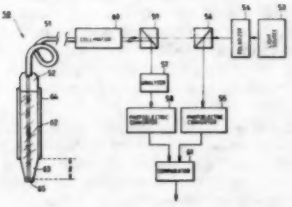
b. means for electrically coupling each of said output means to every other said output means;

c. means for establishing an asymmetrical current capacity for each of said output means, said asymmetrical current



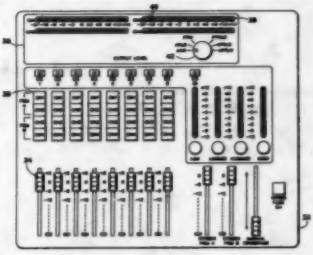
capacity having a current sourcing capability greater than a current sinking capability.

4,920,310
VOLTAGE DETECTOR
Shinichiro Aoshima, and Yutaka Tsuchiya, both of Shizuoka, Japan, assignors to Hamamatsu Photonics Kabushiki Kaisha, Shizuoka, Japan
Filed May 26, 1988, Ser. No. 199,350
Claims priority, application Japan, May 30, 1987, 62-137317
Int. Cl.[5] G01R *19/00, 31/00;* G02F *1/09*
U.S. Cl. 324—96 **8 Claims**



1. A voltage detector for detecting a voltage developing in a selected area of an object to be measured, comprising:
a pulse light source for emitting a pulse light beam;
first guide means for guiding said light beam from said pulse light source;
a voltage-sensing part including an electro-optic material whose refractive index changes according to said voltage developing in said selected area of said object;
splitting and extracting means for extracting a light beam with a first predetermined polarized component from said light beam guided from said first guide means, splitting said light beam with said first predetermined polarized component into a reference light beam and an input light beam which is launched into said electro-optic material, splitting an output light beam emerging from said electro-optic material, and extracting an output light beam with a second predetermined polarized component from one of the split output light beams;
second guide means for guiding said reference light beam and said output light beam with said second predetermined polarized component; and
detection means for determining said voltage developing in said selected area of said object, said detecting means including a first photoelectric converter for detecting intensity of said reference light beam guided from said second guide means and a second photoelectric converter for detecting said output light beam with said predetermined polarized component guided from said second guide means.

4,920,311
USER SELECTION OF METER BALLISTICS
Robert Bateman, 12365 Madrona Way, Nevada City, Calif., and Donald R. Christensen, 10134 Ladybird Dr., Grass Valley, Calif.
Filed Oct. 27, 1988, Ser. No. 263,486
Int. Cl.[5] G01R *19/16;* G01H *3/14*
U.S. Cl. 324—125 **11 Claims**



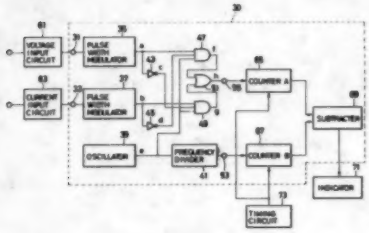
1. An apparatus for user selection of meter ballistics comprising:
means for providing a plurality of meter ballistic standards;
means for selecting a meter ballistic standard from said plurality of meter ballistic standards;
means for converting an input signal into a processed signal according to the meter ballistic standard selected from the plurality of meter ballistic standards;
means for processing the processed signal according to the selected meter ballistic standard to produce a display signal; and
means for displaying the display signal to represent the

4,920,312
MULTIPLIER
Ryuji Maruyama, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Sep. 22, 1988, Ser. No. 247,617
Claims priority, application Japan, Sep. 24, 1987, 62-237454
Int. Cl.[5] G01R *11/32;* G06G *7/16*
U.S. Cl. 324—141 **5 Claims**

1. A multiplier for producing the product of a first input signal and a second input signal comprising:
a first pulse modulator for forming a first modulated pulse train, wherein the difference between the pulse width and half the pulse repetition period is proportional to said first input;
a second pulse modulator for forming a second modulated pulse train wherein the difference between the pulse width and half the pulse repetition period is proportional to said second input;
an oscillator for forming a first reference pulse train;
a coincidence circuit connected to said first and second modulators and said oscillator, for determining coincidences between the levels of said first and second modulated pulse trains and for outputting said first reference pulse train received from said oscillator only when the coincidence takes place;
a first counter connected to said coincidence circuit in order

to count said first reference pulse train outputted from said coincidence circuit;

a frequency divider connected to said oscillator for outputting a second reference pulse train at half the frequency of said first reference pulse train;



a second counter connected to said frequency divider for counting said second reference pulse train; and

a subtractor connected to said first and second counters in order to subtract the output of said first counter from the output of said second counter.

4,920,313

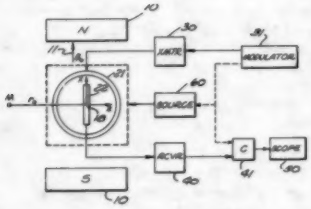
GRAVITATIONAL MASS DETECTOR

James N. Constant, 1603 Danbury Dr., Claremont, Calif. 91711

Continuation-in-part of Ser. No. 2,995, Jan. 11, 1979, abandoned. This application Feb. 11, 1985, Ser. No. 700,871

Int. Cl.[5] G01V *3/00*; G01M *1/12*

U.S. Cl. 324—301 **65 Claims**



1. In a system for detecting at a point P the gravitational field of a mass M located at another point Q at a distance from point P, including in combination:

means for constraining at least one mass m to rotational motion in a path about point P, with the mass m at or near the point P so that the distance between point P and the mass m is small compared to the distance between points P and Q;

said means for constraining being provided by one of a magnetic, electric, electromagnetic and acoustic force acting on mass m and connecting mass m to point P where mass m is a natural mass distinct from a man made mass, and said path being located for maximum response in a plane which contains known tidal forces of mass M; and

means for detecting a signal produced by variations along said path of mass m which variations are produced by tidal forces created by the gravitational field of mass M acting on mass m, which signal includes desired information about mass M.

4,920,314

MAGNETIC RESONANCE IMAGING SYSTEM

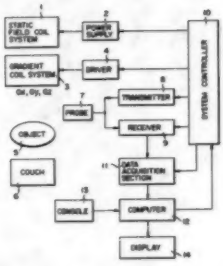
Kozo Satoh, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 4, 1988, Ser. No. 164,496

Claims priority, application Japan, Mar. 6, 1987, 62-50253

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—312 **9 Claims**



1. A magnetic resonance imaging system comprising:

static magnetic field generating means for generating a static homogeneous magnetic field;

slicing gradient magnetic field-generating means for generating a slicing gradient magnetic field whose intensity varies linearly in a direction orthogonal to a slice of interest of an object to be examined, the slicing gradient magnetic field being superimposed on the static magnetic field;

encoding gradient magnetic field-generating means for generating a phase encoding gradient magnetic field whose intensity varies linearly in a predetermined direction in a plane of the slice of interest, the encoding gradient magnetic field being superimposed on the static magnetic field;

reading gradient magnetic field-generating means for generating a reading gradient magnetic field whose intensity varies linearly in a predetermined direction which is in the plane of the slice of interest but is different from the direction of the encoding gradient magnetic field, the reading gradient magnetic field being superimposed on the static magnetic field;

transmitting and receiving means for transmitting high frequency pulses including a selective excitation pulse for exciting magnetic resonance in the slice of interest, and receiving a magnetic resonance signal resulting from magnetic resonance phenomenon excited by the high frequency pulses;

data acquisition means for acquiring magnetic resonance signal data received by the transmitting and receiving means;

sequence control means for driving in a predetermined pulse sequence the slicing gradient magnetic field-generating means, the encoding gradient magnetic field-generating means, the reading gradient magnetic field-generating means, the transmitting and receiving means and the data acquisition means such that the magnetic resonance is excited each time an encoding step determined by the amplitude of the encoding gradient magnetic field is performed and that the data acquisition means acquires the magnetic resonance signal resulting from the magnetic resonance; and

image reconstructing means responsive to the data acquired by the data acquisition means for reconstructing a magnetic resonance image, wherein

said sequence control means producing, with respect to one magnetic resonance image, two types of pulse sequences in which slicing gradient magnetic field pulses are opposite in polarity; and

said reconstructing means including additive combining

means for additively combining data based on the two types of pulse sequences to reconstruct said one magnetic resonance image.

4,920,315

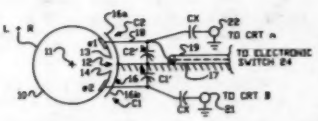
HEAD OF BODY COIL ASSEMBLY FOR MAGNETIC RESONANCE IMAGING APPARATUS

James G. Hokbrook, Mountain View, and Otto J. Jaks, Los Altos, both of Calif., assignors to Resonex, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 890,603, Jul. 25, 1986, abandoned. This application Aug. 24, 1987, Ser. No. 88,680

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—313 **4 Claims**



4. A head or body coil assembly for picking up free induction decay or spin-echo signals for a test specimen produced in a magnetic resonance imaging apparatus comprising:

inductive pick-up coil means associated with said test specimen for receiving said signals;

signal processing means connected to said coil means for providing said induction decay or spin-echo signals, including primary and secondary matching networks, said primary network being in close proximity to said pick-up coil means and said secondary matching network being remote from said pick-up coil means;

said primary and secondary matching networks being connected by a transmission line having a length equal to one-half the wavelength of said signal to be picked up and having a predetermined impedance;

said secondary network including means for detecting phase and magnitude of an RF signal having the wavelength of the signal to be picked up and impressed on said secondary and primary networks, said coil, and said test specimen, and including adjustable capacitors responsive to said detecting means for providing an impedance equal to said characteristic impedance with a 0° phase to provide optimum power transfer.

4,920,316

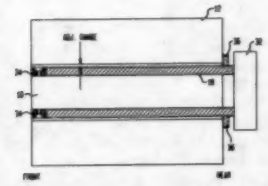
METHOD AND APPARATUS FOR REDUCING BASE FIELD SHIFTS IN A MAGNETIC RESONANCE DEVICE DUE TO PULSED MAGNETIC FIELD GRADIENTS

Heinz Egloff, Fremont, Calif., assignor to Siemens Medical Systems, Inc., Iselin, N.J.

Filed Mar. 30, 1989, Ser. No. 331,424

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—318 **15 Claims**



1. A magnetic resonance device, comprising:

a main magnetic having a bore axially formed therethrough in which a base field is formed;

gradient field forming means positioned inside said bore of said main magnetic for providing at least one field gradient along a given axis inside said bore and said gradient field forming means;

an electrically conductive media located nearby said gradient field forming means which produces at least one disturbing magnetic field along said given axis; and

gradient position adjusting means, including an adjustable positioner, for adjusting the position of said gradient field forming means with respect to said bore of said main magnet so as to cause the center point of the magnetic field along said given axis of said gradient field forming means to substantially coincide with the center point of the disturbing magnetic field along said given axis.

4,920,317

OSCILLATOR FOR MEASURING THE AMBIENT MAGNETIC FIELD

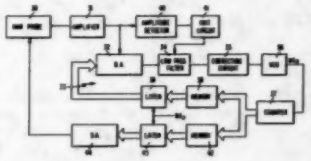
Jean-Louis Lescourret, Bourg Les Valence, France, assignor to Crouzet (Sociéé Anonyme francaise), Montrouge, France

Filed Jan. 23, 1989, Ser. No. 301,523

Claims priority, application France, Jan. 26, 1988, 88 00960

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—318 **6 Claims**



1. An oscillator, used for measuring an ambient magnetic field and having an oscillation frequency substantially proportional to the intensity of said ambient magnetic field, comprising

generation means for generating a low frequency excitation signal,

initialization means for sweeping the frequency of an excitation signal over a range of frequencies,

a magnetic resonance magnetometric probe for detecting a signal at a frequency of magnetic resonance in response to said excitation signal, and

loop means for looking a phase of said excitation signal to a phase of said detected signal,

wherein said generation means delivers said low frequency excitation signal in digital form and said loop uses, as a phase comparator, a first D-A converter whose digital input receives said low frequency excitation signal in digital form and whose bias input receives said signal detected by said probe.

4,920,318

SURFACE COIL SYSTEM FOR MAGNETIC RESONANCE IMAGING

George J. Misic, Hiram; Gregory C. Hurst, Shaker Hts.; G. Neil Holland, Chagrin Falls; John L. Patrick, III, Solon, and Paul T. Orlando, Euclid, all of Ohio, assignors to Picker International, Inc., Highland Hts., Ohio

Division of Ser. No. 765,708, Aug. 14, 1985, Pat. No. 4,793,356. This application Oct. 3, 1988, Ser. No. 252,819

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—318 **13 Claims**

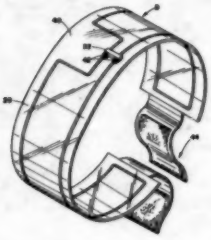
1. A magnetic resonance apparatus for receiving radio frequency resonance signals generated by resonating nuclei, the apparatus comprising:

an electrically conductive coil which is positionable to receive the radio frequency resonance signals from resonating nuclei;

a preamplifier mounted to the coil for amplifying the received resonance signals;

a conductive lead means extending from the preamplifier to a remotely located radio frequency signal processing circuit for conveying the received radio frequency resonance signals to the processing circuit and for conveying electrical power to the preamplifier from the processing circuit;

an impedance adjusting means mounted to the coil for selec-



tively adjusting an impedance match between the preamplifier and at least one of the coil and conductive lead;

a resonant frequency adjusting means mounted to the coil for selectively adjusting a resonant frequency of the coil; and,

a control means for selectively controlling the impedance adjusting means and the resonant frequency adjusting means to adjust the impedance match and the coil resonant frequency, the control means being remotely located from the coil.

4,920,319

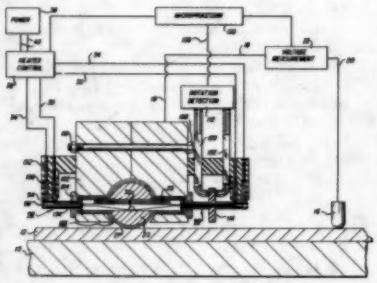
METHOD AND APPARATUS FOR DETERMINING THE THICKNESS OF A COATING ON A METAL SUBSTRATE

John R. M. Viertl, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 3, 1988, Ser. No. 153,292

Int. Cl.[5] **G01N** *25/00, 25/18*

U.S. Cl. 324—451 **13 Claims**



1. Apparatus for determining the thickness of a coating on a metal substrate, said apparatus comprising

(a) a first probe for locally heating said coating so as to establish a temperature gradient therein, said first probe being formed from a material having high thermal conductivity and being at least partially plated with a material having high resistance to oxidation and mechanical wear, said plating material comprising a metal selected from the group consisting of platinum, palladium, rhodium, and iridium, said first probe being further disposed so as to provide an electrical contact to said coating,

(b) a second probe disposed so as to provide an electrical return contact to said coated substrate,

(c) means for controllably heating said first probe so as to maintain the temperature thereof at about 450 degrees C.

(d) heat flow means to determine heat flow from said first probe to said coating,

(e) synchronus detector electric circuit means for measuring the thermoelectric voltag- between said first and second probes,

(f) calculating means for determining the mean value and the variance for a plurality of said measured thermoelectric voltages.

(g) comparison means for comparing said measured thermoelectric voltage to a plurality of predetermined values which represent known coating thicknesses, and,

(i) conversion means for converting said measured thermoelectric voltage to a binary logic signal.

4,920,320

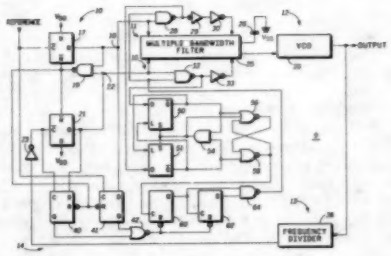
PHASE LOCKED LOOP WITH OPTIMALLY CONTROLLED BANDWIDTH

Lloyd P. Matthews, Buda, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 19, 1988, Ser. No. 285,997

Int. Cl.[5] **H03K** *17/00;* **H03L** *7/00*

U.S. Cl. 328—155 **6 Claims**



1. A method for controlling bandwidth in a filter of a digital phase locked loop to improve speed and stability, comprising the steps of:

receiving an input reference frequency signal having a predetermined phase;

filtering a phase compared signal to provide a control voltage;

coupling the control voltage to an oscillator circuit to provide an output signal which is phase locked to the input reference frequency, said output signal having a frequency varying in proportion to the control signal;

dividing the output signal by an integer multiple to provide a feedback signal having a fundamental frequency of the output signal and a phase; and

comparing the phase of the input reference frequency signal with the phase of the feedback signal to provide the phase compared signal in response thereto, wherein the improvement comprises:

placing the filter in a first predetermined bandwidth in response to a ratio of the phases of the input reference frequency signal and the feedback signal being greater than a predetermined ratio; and either

detecting with a plurality of digital logic gates when the output signal is within a predetermined range of the reference frequency for a predetermined time period by providing a digital counter with a count signal in response to a predetermined number of level transitions of at least one of the input reference frequency signal or

feedback signal and counting a predetermined number of count signals, or

counting with the digital counter to detect when the output signal exceeds and falls below a predetermined frequency a predetermined number of times, before placing the digital filter in a second predetermined bandwidth substantially narrower than the first bandwidth in response thereto.

4,920,321

AMPLIFIER CIRCUIT ARRANGEMENT

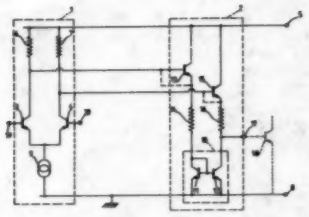
Desmond R. Armstrong, Wallington, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 22, 1988, Ser. No. 289,650

Claims priority, application United Kingdom, Dec. 24, 1987, 8730137

Int. Cl.[5] H03F 3/45

U.S. Cl. 330—257 **8 Claims**



1. An amplifier circuit arrangement comprising: first and second stages in cascade, the first stage comprising a long tail pair of first and second transistors of the same conductivity type and first and second resistors coupling output electrodes of said first and second transistors, respectively, to a first voltage reference point and the second stage comprising a current amplifier circuit and a third resistor, the output electrode end of said first resistor being coupled to a second voltage reference point via said third resistor and the input current path of said current amplifier circuit in that order, and the output electrode end of said second resistor being coupled to said second voltage reference point via a fourth resistor in series with the output current path of said current amplifier circuit, wherein the output current path end of said fourth resistor constitutes an output of the second stage, and wherein the resistance values of said first, second, third and fourth resistors, and the gain of said current amplifier, are chosen such that in operation the voltage at the output of the second stage is substantially independent of variations in the potential on the first voltage reference point relative to the potential on the second voltage reference point.

4,920,322

VOLTAGE CONTROLLED R-C OSCILLATOR AND PHASE LOCKED LOOP

Jan B. F. W. Ruijs, Hilversum, Netherlands, assignor to AT&T Philips Telecommunications, Hilversum, Netherlands

Filed Feb. 23, 1989, Ser. No. 314,532

Claims priority, application Netherlands, Feb. 25, 1988, 8800480

Int. Cl.[5] H03B 5/20; H03K 3/03, 7/06; H03L 7/08

U.S. Cl. 331—17 **3 Claims**

1. A voltage controlled oscillator, comprising:

a series arrangement of a first and a second signal inverter, each signal inverter producing a substantially binary signal with preset voltage levels and the output of the second signal inverter operating as the output of the oscillator; and

a feedback loop comprising:

a resistor whose one end is connected to the output of one of the signal inverters and a capacitor whose one end is connected to the output of the other signal inverter and whose remaining interconnected ends are connected to the input of the first signal inverter through a coupling circuit; and

a control circuit for varying the frequency of the oscillator over a continuous range in accordance with a continuously variable control voltage;

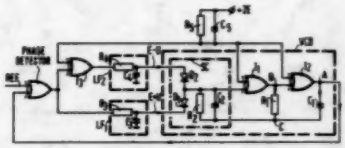
characterized in that the control circuit forms a part of the coupling circuit and comprises:

a second resistor whose one end is connected to the interconnected ends of the first resistor and the capacitor; and

a series arrangement of two equally directed diodes, whose interconnected electrodes are connected to the other end of the second resistor and whose remaining electrodes form the respective control inputs for two oppositely varying control voltages having a symmetrical position with respect to the mean value of the voltages in the interconnected ends of the first resistor and the capacitor, the interconnected electrodes of the diodes being coupled to the input of the first signal inverter.

3. A phase-locked loop comprising a signal controlled oscillator, a phase detector for generating an error signal which is representative of a phase difference between a reference signal and a signal taken from the oscillator and a loop filter for producing from the error signal a control signal for the signal controlled oscillator;

the oscillator comprising a series arrangement of a first and a second EXOR gate, each producing a substantially binary signal with present voltage levels and the output of the second EXOR gate operating as the output of the oscillator, and a feedback loop;



the feedback loop comprising a coupling circuit and a resistor whose one end is connected to the output of the first EXOR gate and a capacitor whose one end is connected to the output of the second EXOR gate and whose remaining interconnected ends are connected to the input of the first EXOR gate through the coupling circuit;

the coupling cirucit comprising a control circuit for varying the frequency of the oscillator over a continuous range in accordance with a continuously variable control voltage;

the control circuit comprising a second resistor whose one end is connected to the interconnected ends of the first resistor and the capacitor, and a series arrangement of two equally directed diodes, whose interconnected electrodes are connected to the other end of the second resistor and whose remaining electrodes form the respective control inputs for two oppositely varying control voltages having a symmetrical position with respect to the mean value of the voltages in the interconnected ends of the first resistor and the capacitor, the interconnected electrodes of the diodes being coupled to the input of the first signal inverter;

the phase detector comprising an EXOR gate with a first input for a substantially binary reference signal voltge and a second input for the substantially binary output voltage of the oscillator, and having an ouput which is connected to one of the control inputs of the oscillator through a first passive low-pass filter and to the other control input of the oscillator through an EXOR gate operating as a logic

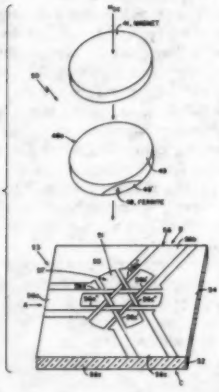
signal inverter and a subsequent second passive low-pass filter corresponding to the first low-pass filter.

4,920,323

MINIATURE CIRCULATORS FOR MONOLITHIC MICROWAVE INTEGRATED CIRCUITS

Ernst F. R. A. Schloemann, Weston; Ronald E. Blight, Framingham, and Robert L. Mozzi, Lincoln, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Dec. 27, 1988, Ser. No. 289,895
Int. Cl.[5] H01P 1/387
U.S. Cl. 333—1.1 **20 Claims**



1. A non-reciprocal microwave device responsive to a DC magnetic field and having at least a pair of ports, comprising:

a dielectric substrate;

a ground plane conductor disposed on a first surface of said substrate;

a patterned strip conductor disposed on said first surface of said substrate, dielectrically isolated from said ground plane conductor, with said patterned strip conductor having a common central portion and at least two strip conductor portions, each one having a first end respectively connected to the common central portion and a second end which provides port connections for the circulator;

a ferrite body, through which said DC field is applied, disposed over said common central portion of said patterned strip conductor; and

a conductive layer disposed around said ferrite body except in regions of said body which come into contact with said strip conductor portions.

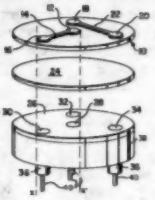
4,920,324

HIGH POWER RF SWITCH

Neil Whittaker, Hudson, and Denis Boulanger, Montreal, both of Canada, assignors to Canadian Patents and Development Limited/Societe Canadienne Des Brevets Et D'Exploitation Limitee, Canada

Filed May 5, 1988, Ser. No. 190,424
Claims priority, application Canada, May 5, 1987, 536435
Int. Cl.[5] H01P 1/10, 5/12
U.S. Cl. 333—106 **5 Claims**

1. In an RF switch comprising a pair of switch contacts and means mounting said switch contacts for rotary movement into and out of a closed position in which a switch connection is established between said switch contacts, the improvement comprising a tuned RF circuit formed on rotatable dielectric material located between said switch contacts, said dielectric material and said switch contacts constituting a capacitive RF



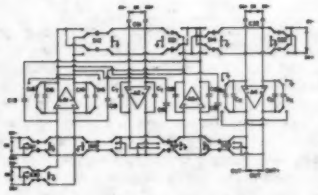
connection between said switch contacts in said closed position.

4,920,325

INTEGRATED ACTIVE ELECTRONIC SWITCHED CAPACITOR FILTER HAVING EXTREMELY LOW SENSITIVITY TO VARIATIONS OF THE COMPONENTS

Germano Nicollini, Piacenza, Italy, and Daniel Senderowicz, Berkeley, Calif., assignors to SGS-Thomson Microelectronics S.p.A., Cantania, Italy

Filed Feb. 26, 1988, Ser. No. 160,643
Claims priority, application Italy, Mar. 5, 1987, 19590 A/87
Int. Cl.[5] H03H 11/12
U.S. Cl. 333—173 **3 Claims**



1. An active filter having an input and an output, and comprising four operational amplifiers coupled in cascade and each having an input and an output, the output of the fourth of said amplifiers being the output of the filter, with respective switched capacitors coupled in series between the output of the first of said amplifiers and the input of the second of said amplifiers, between the output of the second of said amplifiers and the input of the third of said amplifiers and between the output of the third of said amplifiers and the input of the fourth of said amplifiers, and a switched capacitor coupled from the input of the filter to the input of the first amplifier, with fixed capacitors coupled in parallel to the second and third of said amplifiers, respectively, with fixed and switched capacitors coupled in parallel to the first and fourth amplifiers, respectively, wherein a parallel combination of fixed and switched capacitors connects the input of the filter to the input of the fourth amplifier, and a fixed capacitor connects the input of the filter to the input of the second amplifier.

4,920,326

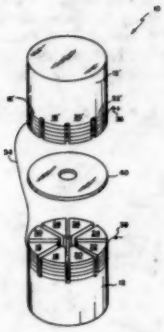
METHOD OF MAGNETIZING HIGH ENERGY RARE EARTH ALLOY MAGNETS

Ashok K. Agarwala, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 26, 1989, Ser. No. 301,687
Int. Cl.[5] H01F 13/00
U.S. Cl. 335—284 **6 Claims**

1. A method of magnetizing high energy rare earth alloy

magnets to saturation which comprises, subsequent to formation of the alloy, heating to a temperature at least 10° C. above



room temperature to less than one-half the curie temperature and applying a magnetizing charging field less than 24 Kilo-Oersteds.

4,920,327

CHIP-TYPE MICRO-FUSE

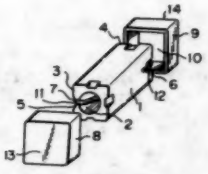
Hiroo Arikawa, Tokyo, and Yasutada Yuza, Kanagawa, both of Japan, assignors to SOC Corporation, Tokyo, Japan

Filed Sep. 30, 1988, Ser. No. 251,441

Claims priority, application Japan, Oct. 1, 1987, 62-149330[U]

Int. Cl.[5] H01H *85/16*

U.S. Cl. 337—231 **10 Claims**



1. A chip-type micro-fuse comprising:

a body made of heat-resistant and insulative material, said body having a pair of end faces spaced opposed to each other, an outer peripheral surface extending between said pair of end faces, a hole defined in said body and extending through said body between said pair of end faces, at least two recesses respectively provided on said outer peripheral surface at each one of said pair of end faces of said body;

an elongated fusible element, the length of said fusible element being longer than that of said hole, said fusible element being disposed within and extending through said hole in said body, one of a pair of end portions of said fusible element being disposed on one of said pair of end faces and in one of said recesses provided at one of said pair of end faces of said body, the other one of said pair of end portions of said fusible element being disposed on the other one of said pair of end faces and in the other one of said recesses provided at the other one of said pair of end faces of said body, and the remaining portion of said fusible element extending between said pair of end faces through said hole in said body; and

a pair of conductive and solderable terminal members respectively fitted onto a corresponding one of said pair of end faces of said body, each one of said pair of terminal members including a wall having an inner face opposing the respective end face of said body, a peripheral portion connected angularly to the periphery of said wall and covering said outer peripheral surface at each one of said pair of end faces of said body, each one of said end portions of said fusible element disposed on each one of said pair of end faces being firmly held between each of one of said pair of end faces of said body and each one of said inner faces of said terminal members, and each one of said end portions of said fusible element being electrically connected to each one of said inner faces of said terminal members.

4,920,328

MATERIAL FOR RESISTOR BODY AND NON-LINEAR RESISTOR MADE THEREOF

Masahiko Hayashi, Kanagawa; Yoshiyuki Inami, Tokyo, and Naoto Teshima, Shizuoka, all of Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Nov. 14, 1988, Ser. No. 270,084

Claims priority, application Japan, Nov. 12, 1987, 62-286155

Int. Cl.[5] H01C *7/10*

U.S. Cl. 338—21 **14 Claims**

1. A non-linear resistor which includes a resistor body formed with a composite material composed of:

Bi_2O_3	0.25 to 1.0 mol %;
Sb_2O_3	0.5 to 2.0 mol %;
Co_2O_3	0.25 to 1.0 mol %;
MnO_2	0.25 to 1.0 mol %;
Cr_2O_3	0.1 to 1.0 mol %;
NiO_2	0.1 to 1.0 mol %;
SiO_2	0.25 to 2.0 mol %; and
ZnO	remainder for 100 mol %, and

said resistor body including ZnO crystal, average particle size of which is adjusted within a range of 5 μm to 10 μm.

4,920,329

IMPEDANCE-COMPENSATED THICK-FILM RESISTOR

John M. Tischer, Streamwood, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 13, 1989, Ser. No. 406,661

Int. Cl.[5] H01C *3/00, 1/012*

U.S. Cl. 338—333 **4 Claims**

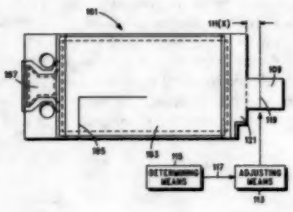
1. An impedance-compensated thick-film resistor (TFR) having at least one terminal, comprising:

a thick-film capacitor (TFC) coupled to said terminal, said TFC comprising a generally rectangular-shaped metallized portion having a length extending a finite distance (L) away from said terminal, L based at least in part on $(\beta - K_1 - K_2 * R_{fired})/K_3$, where

β=the TFR's final effective capacitance,

K_1 = the TFR's fixed capacitance,

K_2 = the TFR's capacitance slope,



R_{fired} = the TFR's fired resistance, and

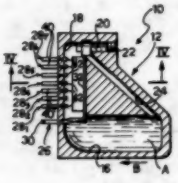
K_3 = the TFC's capacitance slope.

4,920,330

MERCURY INERTIAL TRANSDUCER AND LIGHT-EMITTING INDICATOR FOR MOTOR VEHICLES

Lisio Piozner, Pordenone, Italy, assignor to B.P.T. S.p.A., Venice, Italy

Filed Jul. 18, 1988, Ser. No. 220,149
Claims priority, application Italy, Jul. 16, 1987, 67614 A/87
Int. Cl.[5] B60Q *1/50*; H01H *35/02*
U.S. Cl. 340—467 **22 Claims**



1. A mercury inertial transducer comprising:

a casing which defines a substantially L-shaped cavity with a substantially horizontal lower arm and a substantially vertical ascending arm, with reference to its position of use;

a volume of mercury which, in A rest condition, occupies the lower arm and essentially does not occupy the ascending arm;

an input electrode which penetrates the lower arm from the outside and is permanently immersed in the mercury, and

output electrode means which penetrate the ascending arm from the outside and can be reached by the mercury when the mercury rises in the ascending arm due to an inertial force directed along the lower arm and towards the ascending arm,

wherein the output electrode means are constituted by a series of separate output electrodes which are spaced along the ascending arm and can be reached in succession by the mercury and

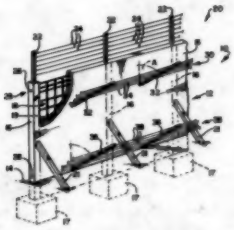
wherein said transducer includes a support which can be fixed to a movable object, such as a motor vehicle, and on which the transducer is mounted so as to enable the adjustment of the inclination of its lower arm to the horizontal and of its ascending arm to the vertical.

4,920,331

SECURITY BARRIER WITH INTRUSION SESNING AND DELAYING MEANS

Hendrik M. Ver Loren van Themaat, and Pieter L. Raath, both of Pretoria, South Africa, assignors to Sekerheid En Elektronika Laboratoria, Pretoria, South Africa

Filed Oct. 18, 1988, Ser. No. 259,282
Claims priority, application South Africa, Oct. 19, 1987, 87/7852
Int. Cl.[5] G08B *13/12, 15/00*
U.S. Cl. 340—541 **17 Claims**



1. A security installation for a property, which includes

an imperforate protective barrier extending upwardly from the ground and having a first side facing away from a property protected by the barrier, as well as a second side facing towards the property, with at least the second side extending vertically upwardly;

detection means in or on the barrier for detecting the presence of an intruder breaching, or attempting to breach, the barrier; and

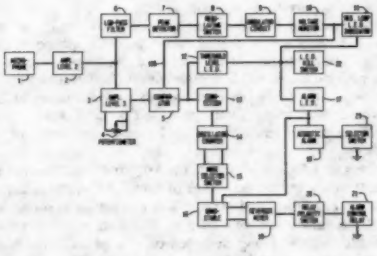
delaying means protruding from the second side of the barrier at the lower lever than the detection means, and adapted to delay the intruder on the intruder's breaching the barrier.

4,920,332

DIFFERENTIAL DETECTOR OF ACOUSTIC PRESSURE

Francois Philippe, Cai 33 Ave du Docteur Lefebure, 06270 Villeneuve Loubet, France

Filed Oct. 31, 1988, Ser. No. 265,249
Int. Cl.[5] G08B *13/20*
U.S. Cl. 340—544 **10 Claims**



1. Differential detector of acoustic pressure, for detecting an aperiodic wave resulting from opening of a door or a window is closed premises while disregarding passing pressure variations caused by air leaks and flexing of building materials, including a microphone (1) and means for setting a threshold value level,

comprising,

means for regulating (6, 10) in order to vary said threshold value in accordance with the microphone output, includ-

ing a regulating loop, including a filtering circuit (6), receiving as an input a signal coming from the microphone, and generating an output signal (105) filtered of said passing variations, and

said detector further comprises

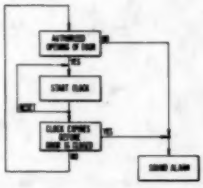
a comparator (5) having two inputs, one receiving said regulating loop output signal (105), and the other receiving another signal coming from the microphone.

4,920,333

INTERNAL PILFERAGE ALARM

Robert Barr, 1412 Rail Ave., Clovis, 93612, and Joel A. Fletcher, San Francisco, Calif., assignors to Robert Barr, Clovis, Calif.

Filed May 26, 1988, Ser. No. 199,064
Int. Cl.[5] G08B 13/08
U.S. Cl. 340—545 14 Claims



1. A method of activating an indication device, to indicate the unauthorized opening of a door, which may be temporarily deactivated for only a preset period of time, comprising the steps of

determining whether opening of the door is authorized;

activating the indication device if opening of the door is unauthorized;

activating a timing clock set to run for a preselected period of time if opening of the door is authorized, and

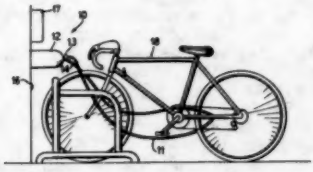
activating the indication device if the door is not closed within the time period set for the timing clock to run.

4,920,334

SECURITY SYSTEM FOR BICYCLES, SKI RACKS AND COAT RACKS

Dean R. DeVolpi, 603 Columbine, Lisle, Ill. 60532

Filed Apr. 24, 1989, Ser. No. 341,837
Int. Cl.[5] G08B 13/14; H01H 47/00
U.S. Cl. 340—568 7 Claims



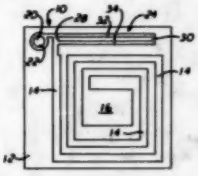
1. A locking system comprising, a holding member, a flexible locking cable with its first end attached to said holding member and adapted to be passed through an article which is to be locked to said holding member, the second end of said cable formed with a locking shoulder, a pair of locking jaws attached to said holding member and said second end of said cable insertable therein to lock said jaws behind said shoulder, a flexible conduit means which extends through said cable from said first to said second end, an energy transmitter connected to one end of said flexible conduit, and an energy sensor coupled to the other end of said flexible conduit to detect when said cable and flexible conduit are severed, including a microcontroller connected to said locking jaws to lock and unlock them, including a solenoid connected to said locking jaws and to said micro-controller and including an alarm connected to said micro-controller and said energy sensor connected to said micro-controller.

4,920,335

ELECTRONIC ARTICLE SURVEILLANCE DEVICE WITH REMOTE DEACTIVATION

George F. Andrews, Cocoa, Fla., assignor to Interamerican Industrial Company, Miami, Fla.

Filed Jan. 31, 1989, Ser. No. 304,202
Int. Cl.[5] G08B 13/24
U.S. Cl. 340—572 7 Claims



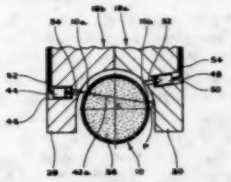
1. In an electronic article surveillance device of the type employing a parallel resonant circuit designed to respond to a first frequency, F_1, of transmitted electromagnetic radiation; the improvement comprising deactivation means formed in the parallel resonant circuit, said deactivation means comprising a transmission line resonator having a first end shorted to the parallel resonant circuit and a second open end, said transmission line resonator having a length defined by said first and second ends and said length being substantially equal to one quarter of the wavelength of a second frequency, F_2, of transmitted electromagnetic radiation used to excite said transmission line resonator to interrupt the parallel resonant circuit at said first end of said transmission line resonator, whereby the electronic article surveillance device is deactivated.

4,920,336

METHOD AND APPARATUS FOR MONITORING THE LEVEL OF THE CONTENTS IN A CONTAINER

Robert S. Meijer, San Diego, Calif., assignor to Fisher Scientific Company, Pittsburgh, Pa.

Filed Nov. 22, 1988, Ser. No. 275,323
Int. Cl.[5] G01F 23/00
U.S. Cl. 340—619 43 Claims



1. A monitor of the contents in a container for detecting when the contents are below a predetermined level, said monitor comprising:

(a) emitting means on a first side of the container for producing an intermittent optical metering signal directed into the container;

(b) receiving means on a second side of the container opposite said first side thereof for generating an electronic

signal proportional to illumination incident on said receiving means, said optical metering signal being incident to said receiving means only when the contents of the container are below the predetermined level;

(c) detection means coupled electronically to said emitting means and said receiving means for producing a verification signal when said electronic signal is synchronized with said metering signal; and

(d) alerting means coupled electronically to said detection means for generating a status signal in response to said verification signal, said status signal indicating that the level of the contents of the container is below the predetermined level.

4,920,337

DISPLAY APPARATUS

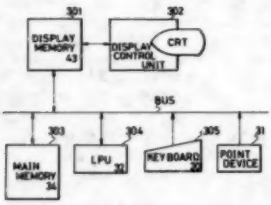
Hideo Kuo, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 660,988, Oct. 15, 1984, abandoned. This application Oct. 13, 1987, Ser. No. 106,888

Claims priority, application Japan, Oct. 17, 1983, 58-193874; Oct. 17, 1983, 58-193875

Int. Cl.[5] G09G *1/00*

U.S. Cl. 340—721 **13 Claims**



1. A display apparatus comprising:

memory means for storing therein image data to be edited and command image data representing a command for editing the image data to be edited, said image data and said command image data being stored in first and second memory areas, respectively;

display means for displaying the image data and the command image data stored in said memory means, said display means having first and second display areas;

control means adapted to display a part of the image data on said first display area and to display the command image data, in place of the remaining image data, on said second display area, said control means including a register for storing data corresponding to a display address of a boundary between said first display area and said second display area, said control means adapted to stop reading image data from said first memory area when a display address of the image data is coincident with data corresponding to a display address of the boundary during display of the image data, and further adapted to read the command image data from said second memory area and display same on said display means; and

erasure means for changing data corresponding to a display address of the boundary stored in said register and erasing the command image displayed on said display means.

4,920,338

AUTOMATIC SEAT POSITIONING DEVICE FOR AUTOMOTIVE VEHICLE AND THE LIKE

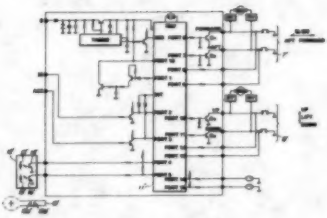
Masakazu Tsunoda, Fujisawa; Akimitsu Inoue, Toride, and Tsutomu Yamamoto, deceased, late of Ibaragi, all of Japan (by Tatsuyo Yamamoto, Hirofumi Yamamoto, Toshifumi Yamamoto, Ikuko Yamamoto, legal representatives), assignors to Nissan Motor Co., Ltd., Yokohama and Niles Parts Co., Ltd., Tokyo, both of, Japan

Filed Jun. 3, 1988, Ser. No. 201,995

Claims priority, application Japan, Jun. 4, 1987, 62-139024

Int. Cl.[5] H04Q *3/02*; B60R *25/04*

U.S. Cl. 340—825.300 **10 Claims**



10. A seat position control arrangement as claimed in claim 7 wherein said control circuit comprises:

first and second analog multiplexers, said first and second multiplexers each having first, second and third ports, the first ports of said first and second multiplexers being connected with said key reader, said second and third ports of said first and second multiplexers being connected respectively with the first and second variable resistors of said first and second seat position control switches;

third and fourth variable resistors;

first and second differential amplifiers, said first and differential amplifier being connected with an output port of said first multiplexer and said third variable resistor, said second differential amplifier being connected with an output port of said second multiplexer and said fourth variable resistor;

first and second comparators, said first and second comparators being connected between said first differential amplifier and said first motor; and

third and fourth comparators, said third and fourth comparators being connected between said second differential amplifier and said second motor.

4,920,339

SWITCHABLE BUS TERMINATION AND ADDRESS SELECTOR

Robert C. Friend, Laguna Niguel, and Charles R. Patton, III, Long Beach, both of Calif., assignors to Western Digital Corp., Irvine, Calif.

Filed Jan. 6, 1989, Ser. No. 295,070

Int. Cl.[5] H04J *3/02*

U.S. Cl. 340—825.520 **16 Claims**

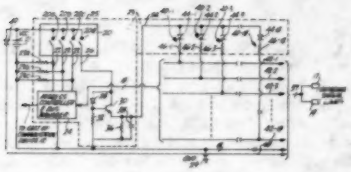
1. In a communication network having a plurality of devices for communication therebetween over at least one transmission path coupling the devices together, at least one said device being addressable and responsive to a selected address for communication, a switchable termination module associated with said at least one addressable device, the module comprising:

a port for connection to the at least one transmission path;

a controllable terminator for the at least one transmission path connected to the port; and

a switch having a first set of switch conditions for enabling the terminator to terminate the transmission path and for simultaneously selecting one of a plurality of addresses to

which the at least one device responds, and a second set of switch conditions for disabling the terminations of the



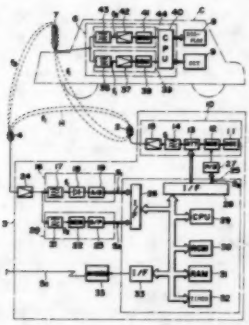
terminator and for simultaneously selecting any one of a plurality of addresses for the at least one device.

4,920,340

VEHICLE DETECTING METHOD AND SYSTEM WHICH CAN COMMUNICATE WITH VEHICLES

Masao Mizuno, Kyoto, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Apr. 21, 1986, Ser. No. 854,312
Claims priority, application Japan, Apr. 22, 1985, 60-86064
Int. Cl.[5] G08G *1/09*
U.S. Cl. 340—905 **20 Claims**



1. A vehicle detecting method which can communicate with vehicles, comprising the steps of:

arranging a transmitting coil on one side of a predetermined detection area set over a roadway of vehicles and a receiving coil on the other side of said detection area, the transmitting coil emitting a first high frequency signal having a first frequency and the receiving coil receiving the first high frequency signal of the first frequency and a second high frequency signal having a second frequency different from said first frequency;

applying said first high frequency signal of said first frequency to said transmitting coil to form a high frequency magnetic field between the transmitting coil and the receiving coil, and detecting the existence of a vehicle by detecting a change in a signal characteristic of a signal induced in said receiving coil when the vehicle enters said magnetic field;

modulating said first high frequency signal which is applied to the transmitting coil by data to be transmitted to the vehicle; and

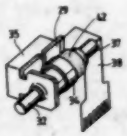
receiving by the receiving coil said second high frequency signal which is transmitted from the vehicle and also demodulating the received second high frequency signal, thereby executing at least a unidirectional communication with the vehicle.

4,920,341

MAGNETIC ROTARY ENCODER DEVICE

Tsuyoshi Aoki, Wakuya, and Yasuhisa Ohsumi, Sendai, both of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Dec. 9, 1988, Ser. No. 282,806
Claims priority, application Japan, Mar. 8, 1988, 63-29844[U]; Mar. 9, 1988, 63-30316[U]
Int. Cl.[5] H03M *1/00*; G01B *7/30*
U.S. Cl. 341—15 **6 Claims**



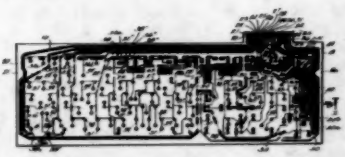
1. A magnetic rotary encoder device, comprising a fixed shaft fixedly supported at least at one portion thereof, an inner bearing means provided on an outer periphery of said fixed shaft, an outer bearing means disposed in an opposing relationship to and held in engagement with said inner bearing means with a low coefficient of friction, a cylindrical member having said outer bearing means provided on an inner periphery thereof, a magnetic means provided on an outer periphery of said cylindrical member and extending perpendicularly to the direction of an axis of said outer bearing means, said magnetic means having magnetic poles formed thereon, a magnetic sensor for detecting a magnetic flux from any of said magnetic poles, a mounting plate for fixedly supporting said magnetic sensor on said fixed shaft, and a detecting member mounted in sliding contact with said cylindrical member to rotate said magnetic means around its axis.

4,920,342

MEMBRANE SWITCHCORES WITH HIGH RESISITIVITY INK CIRCUITS

Norman G. Gratke, Elm Grove, Wis., assignor to W. H. Brady Co., Milwaukee, Wis.

Filed Oct. 25, 1988, Ser. No. 262,568
Int. Cl.[5] H03M *11/00*
U.S. Cl. 341—22 **5 Claims**



1. A membrane switchcore of flexible plastic film for use in an alphanumeric keyboard and adapted for connection to electronic device circuitry for transmitting an electrical signal to the switchcore and electronic sense circuitry for detecting a change in the electrical signal transmitted across the switchcore, comprising:

an insulating layer;

a plurality of conductive row traces along a first surface of the insulating layer;

a plurality of conductive column traces along a second surface of the insulating layer opposite the first surface;

at least 36 key cells, each key cell being connected between one of said row conductive traces on the first surface and one of said column conductive traces on the second surface, and each key cell including conductive key cell elements for effecting a change in impedance between

drive and sense connections to the row and column traces in response to manual actuation of the key cell; and

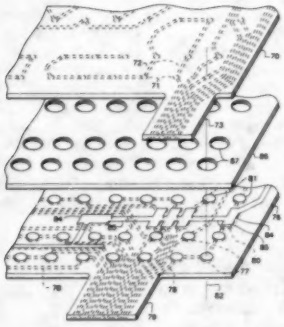
the row traces, the column traces, and the key cell elements define paths for the transmission of electrical signals between drive and sense connections to the switchcore and are formed of a conductive high resistivity ink having a resistivity of at least about 10 ohms per square per 0.001" of ink thickness, and wherein the net resistance for one of the row traces and one of the column traces in at least one said path defined by said one row trace, said one column trace, and one of the key cells connected to said one row trace and one column trace is greater than approximately 5,000 ohms for each of said one row trace and said one column trace.

4,920,343

CAPACTIVE KEYSWITCH MEMBRANE WITH SELF CONTAINED SENSE-TO-GROUND CAPACITANCE

Kenneth E. Schwartz, El Paso, Tex., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 30, 1988, Ser. No. 252,228
Int. Cl.[5] H03M *11/00, 17/98*
U.S. Cl. 341—33 **7 Claims**



1. A key actuable capacitive switch membrane assembly comprising:

flexible dielectric sheet means having first and second parallel proximate portions each with first and second surfaces arranged so that the first surfaces are adjacent and the second surfaces are separated by at least the first and second portions;

first, second and third patterns of electrically conductive material on the first surface of the first portion of said sheet means, the first surface of the second portion of said sheet means and the second surface of the second portion of said sheet means respectively, portions of said first, second and third patterns being aligned in a direction perpendicular to the portions of the sheet means so as to form first, second and third plates of an array of capacitors, portions of said first and third patterns forming first and second pluralities of conductors respectively arranged in a cross point matrix, the first and second pluralities of conductors being connected to the first and third plates of the capacitors in the array so that each capacitor is connected to a unique pair of conductors, portions of the second and third patterns forming coupling capacitor means for coupling the second plurality of conductors together ; and

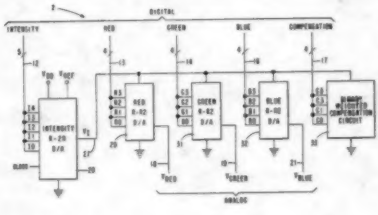
spacer means interposed between the first surfaces of the first and second portions of said sheet means so as to normally maintain a predetermined separation between the first surfaces, said spacer means being of a design which permits the spacing of the first and second plates of capacitors in the array to be varied, whereby each capacitor has a variable capacitance between its first and second plates in series with a fixed capacitance between its second and third plates.

4,920,344

DIGITALLY COMPENSATED MULTIPLYING DIGITAL TO ANALOG CONVERTER

David L. Henderson, and Carl M. Stanchak, both of Colorado Springs, Colo., assignors to NCR Corporation, Dayton, Ohio

Continuation of Ser. No. 3,153, Jan. 14, 1987, abandoned, Division of Ser. No. 710,658, Mar. 11, 1985, Pat. No. 4,779,029. This application Jun. 2, 1988, Ser. No. 205,046
Int. Cl.[5] H03M *1/76*
U.S. Cl. 341—118 **9 Claims**



1. A multiplying digital to analog converter comprising:

a first digital to analog converter providing an analog output in response to a first digital word input;

a second digital to analog converter connected to receive the output from the first digital to analog converter and provide an output responsive to a second digital input word and in proportion to the magnitude of the output of the first digital to analog converter; and

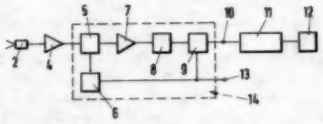
compensation means, connected to the second digital to analog converter and varying in magnitude based upon the data represented by the second digital input word, for offsetting loading effects on the first digital to analog converter caused by changes in the second digital word.

4,920,345

DEVICE OPERATING ON THE DOPPLER PRINCIPLE TO DETERMINE THE DISTANCE TRAVELED BY A VEHICLE

Ernst Lissel, and Raimond Holze, both of Wolfsburg, Fed. Rep. of Germany, assignors to Volkswagen AG, Wolfsburg, Fed. Rep. of Germany

Filed Oct. 21, 1988, Ser. No. 261,171
Claims priority, application Fed. Rep. of Germany, Oct. 30, 1987, 3736762
Int. Cl.[5] G01S *13/60, 13/62*
U.S. Cl. 342—70 **3 Claims**



1. Apparatus for indicating the distance traveled by a vehicle comprising microwave signal-generating means including transmitter means and antenna means for emitting rays at a predetermined angle with respect to a surface on which the vehicle is traveling, receiver means for receiving the reflected rays and providing signals representing the differential frequency between the frequencies of emitted and reflected rays, variable band pass filter means having a variable lower fre-

quency limit trailing the differential frequency, comparator means following the variable band pass filter means to generate a synchronizing signal, phase-locked loop circuit means responsive to the synchronizing signal to produce a pulse output signal whose frequency is a function of the vehicle speed and an analog voltage output signal whose voltage is a function of the vehicle speed, counter means responsive to the pulse output signal from the phase-locked loop means to provide signals indicating the distance traveled by the vehicle, and a tuning oscillator to control the lower frequency limit of the variable band pass filter means, one of said pulse and analog voltage signals being supplied to the tuning oscillator to control said lower frequency limit.

4,920,346

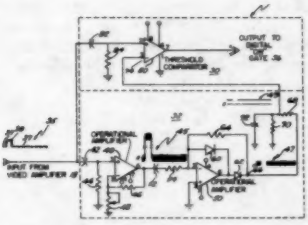
UNIDIRECTIONAL AMPLITUDE SENSITIVE NOISE RIDING THRESHOLD CIRCUIT

William P. Huntley, Old Lyme, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 176,958, Apr. 4, 1988, Pat. No. 4,860,013. This application Jun. 30, 1989, Ser. No. 373,955

Int. Cl.[5] G01S *13/00*

U.S. Cl. 342—91 **2 Claims**



1. A unidirectional amplitude sensitive noise riding threshold circuit comprising:

a noise compensator connected to receive a signal, said noise compensator having processing means for generating a DC voltage proportional to the noise within said received signal, said noise compensator further comprising, first amplification means connected to receive said signal, said first amplification means having a wide dynamic range for amplifying said signal, a high pass filter, connected to receive said amplified signal from said first amplification means, for discriminating against low frequency and DC noise components thereof, and second amplification means connected to receive said amplified and filtered signal from said high pass filter, said second amplification means for rectifying said received signal and for generating a DC voltage proportional to the noise within the signal received by said first amplification means; and

a comparator connected to receive at one input the same signal as that received by said noise compensator, and to receive at another input said DC voltage from said noise compensator, said comparator providing a predetermined output signal when said amplitude of said signal received by said noise compensator and said comparator exceeds said DC voltage from said noise compensator.

4,920,347

PULSE DOPPLER RADAR SYSTEM

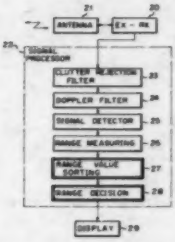
Noboru Kurihara, Kanagawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 12, 1989, Ser. No. 337,182

Claims priority, application Japan, May 7, 1988, 63-167314; Jul. 11, 1988, 63-172206

Int. Cl.[5] G01S *13/34*

U.S. Cl. 342—130 **12 Claims**



1. A pulse doppler radar system for transmitting pulse-modulated signals from an antenna apparatus and for receiving an echo signal from a target through said antenna apparatus to measure the range to the target, comprising:

exciter-receiver means operable to alternately generate a first signal having a constant frequency in a first period and a second signal modulated with a linearly-changing frequency in a second period and to pulse-modulate said first and second signals at a predetermined pulse repetition rate so as to supply the pulse-modulated first and second signals to said antenna apparatus and for receiving an echo signal from said antenna apparatus, thereby enabling said antenna apparatus to alternately transmit the pulse-modulated first signal and the pulse-modulated second signal;

signal processing means coupled to said exciter-receiver means to detect doppler frequencies included in said echo signal received in said first period and doppler frequencies included in said echo signal received in said second period, respectively, for calculating the value indicating the range to said target on the basis of the differences between said doppler frequencies received in said first period and those received in said second period, said signal processing means being operable, when a plurality of doppler frequency signals are received in both of said first and second periods, to calculate the range values on the basis of all the differences between said plurality of doppler frequencies received in said first period and those received in said second period, thereby enabling the number of same range values to be obtained so that the range value corresponding to the largest number can be determined to be a value indicating the range to said target; and

means for displaying the range of said target on the basis of the so determined range value.

4,920,348

METHOD AND APPARATUS FOR SIGNAL MODULATION AND DETECTION

Elie J. Baghdady, 21 Overlook Dr., Weston, Mass. 02193

Filed Oct. 8, 1987, Ser. No. 106,126

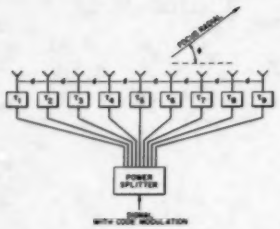
Int. Cl.[5] G01S *5/04*; H04B *1/10*

U.S. Cl. 342—433 **33 Claims**

1. A method of receiving a signal wave occupying a predetermined bandwidth that imparts to it a digital modulation whose level depends on the direction of arrival of the signal wavefront, and which as a result creates a digitally modulated component signal embodying energy diverted from the arriving signal to a more widely spread spectrum, and hence re-

duces the signal spectral density within said predetermined bandwidth, the fraction of the total arriving signal energy so diverted being dependent on the direction of arrival of the signal wavefront, comprising the steps of:

providing a set of different positions in space for intercepting an arriving signal wavefront;



controlling the time of the reception from each of said different positions to abruptly hop among said positions, which in effect times the introduction into the received signal of an abrupt direction-dependent shift;

adjusting the separation between successively hopped positions of signal wavefront interception; and

adjusting the orientation of the line segment between successively hopped positions of signal wavefront interception.

4,920,349

ANTENNA MOUNTING WITH PASSIVE STABILIZATION

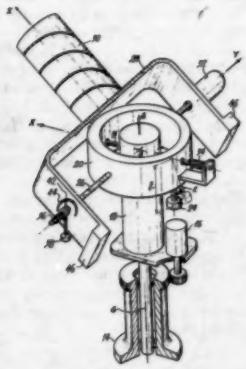
Jean C. Le Gall, Perros Guirec, France, assignor to Centre National d'Etudes des Telecommunications, France

Filed Jul. 26, 1984, Ser. No. 634,582

Claims priority, application France, Aug. 3, 1983, 83 12821

Int. Cl.[5] H01Q *1/34*

U.S. Cl. 343—709 **12 Claims**



1. For use on a ship, an antenna mounting system with controlled movement about bearing and elevation axes and passive stabilization about a transverse axis orthogonal to the bearing and elevation axis, comprising:

(a) a stationary stand;

(b) gimbal suspension means having: a gimbal support pivotally connected to said stand for rotation thereon about a bearing axis; an intermediate unit mounted on said gimbal support for oscillating movement thereon about a transverse axis at right angles to said bearing axis and having a center of gravity below said transverse axis; and an antenna support pivotally mounted on said intermediate unit for rotation thereon about an elevation axis at right angles to said intermediate axis;

(c) gravity responsive return means operatively connecting said intermediate unit and said gimbal support and arranged for retaining said intermediate unit into a predetermined direction relative to horizontal, said return means including: a pendular body pivotally connected to said gimble support about an axis parallel to said transverse axis for indicating an apparent vertical direction; and a gear train operatively connecting said intermediate unit and pendular body, said gear train being arranged so that any angular deviation of the intermediate unit from a predetermined set direction causes deviation of the angular body from said vertical position in the same angular direction.

4,920,350

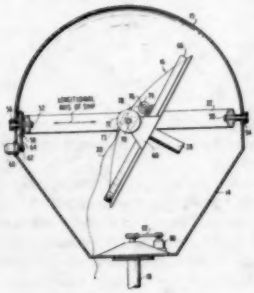
SATELLITE TRACKING ANTENNA SYSTEM

William H. McGuire, Montgomery, Md., and Thomas J. Tilden, Falls Church, Va., assignors to Comsat Telesystems, Inc., Fairfax, Va.

Continuation of Ser. No. 89,005, Aug. 20, 1987, which is a continuation of Ser. No. 873,301, Jun. 9, 1986, abandoned, which is a continuation of Ser. No. 581,164, Feb. 17, 1984, abandoned. This application Jul. 6, 1988, Ser. No. 224,186

Int. Cl.[5] H01Q *1/18, 3/08*

U.S. Cl. 343—709 **12 Claims**



1. A satellite tracking system comprising:

a radome mount fixed to an unstabilized movable structure;

a ring journalled for rotation on said mount and arrange such that the axis of rotation of said ring is aligned with a principal longitudinal axis of said structure;

means for rotating said ring relative to said mount comprising a stepper motor fixed to a wall of said radome mount, and gear means inside said radome mount for converting stepper motor movement into rotation of said ring;

an antenna journalled for rotation on said ring, said antenna contained in said ring and having an axis of rotation substantially perpendicular to the axis of rotation of said ring; and

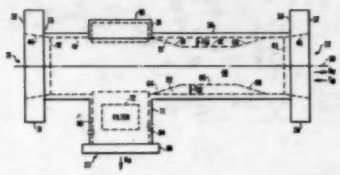
means for rotating said antenna relative to said ring.

4,920,351

DIPLEXER FOR ORTHOGONALLY POLARIZED TRANSMIT/RECEIVE SIGNALLING ON COMMON FREQUENCY

Homer E. Bartlett, Palm Bay, and Kevin P. Gallagher, Indian Harbor Beach, both of Fla., assignors to Computer Science Inovations, Inc., Palm Bay, Fla.

Filed Mar. 24, 1986, Ser. No. 843,008
Int. Cl.[5] H01Q 13/00; H01P 1/213
U.S. Cl. 343—756 20 Claims



1. A microwave coupling device comprising:

a first waveguide section having a first end which forms a first port of said device and a second end which forms a second port of said device, said first port coupling into said first waveguide section a first signal, lying in a first frequency band, having a first polarization and a second signal, lying in said first frequency band, having a second polarization orthogonal to said first polarization, said second port coupling into said first waveguide section a third signal having said second polarization and lying in a second frequency band, higher than said first frequency band;

a second waveguide section having one end thereof coupled to said first waveguide section at a location between the first and second ends thereof and having a second end forming a third port of said device;

frequency selective, polarization filter means, disposed within said first waveguide section between said location and the second end of said first waveguide section, for preventing said second signal from being coupled from said location to said second port, while permitting the passage of said first and third signals through said first waveguide section between said first and second ports; and

frequency filter means, disposed within said second waveguide section and having a passband corresponding to said first frequency band, for passing said second signals therethrough while preventing the coupling of said third signals between said location and said third port.

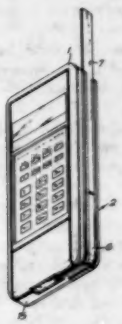
4,920,352

RETRACTABLE ANTENNA

Nils E. V. Martensson, Long Acre, and Michael B. Ashdown, Kingshill, both of England, assignors to Technophone Limited, United Kingdom

Filed May 12, 1989, Ser. No. 351,866
Claims priority, application United Kingdom, May 27, 1988, 8812703
Int. Cl.[5] H01Q 1/24
U.S. Cl. 343—702 20 Claims

1. An antenna assembly comprising an antenna support and an antenna retractably mounted at least partially within said support, the antenna being in the form of a tape, the support defining a passageway in which the tape is slidably received, and contact means for making electrical connection to the antenna being provided on the support in the passageway, wherein the tape, and passageway are shaped so as to impose a bend transversely across the tape at least in the region of the contact means such that the convex side of the tape confronts



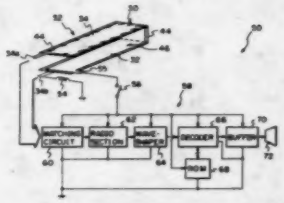
the contact means and rigidity is imparted to the tape when extended from the passageway.

4,920,353

ANTENNA FOR PORTABLE RADIO COMMUNICATION APPARATUS

Toshihiro Mori, and Kazuyuki Tsunoda, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Jun. 29, 1988, Ser. No. 213,290
Claims priority, application Japan, Jun. 29, 1987, 62-159888
Int. Cl.[5] H01Q 1/24
U.S. Cl. 343—702 25 Claims



1. In an antenna of a radio communication apparatus which is powered by at least one generally flat battery with positive and negative terminals, the improvement wherein at least one flat part of said antenna is integrally constituted by a flat conductive sheath member which comprises a flat portion of said battery.

4,920,354

MANUALLY EXTENDABLE TELESCOPING ANTENNA

Bernard Rauser, Gaimersheim, and Robert Harth, Ingolstadt, both of Fed. Rep. of Germany, assignors to Audi Ag, Ingolstadt, Fed. Rep. of Germany

Filed Dec. 1, 1987, Ser. No. 127,195
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1986, 3641530
Int. Cl.[5] H01Q 1/10
U.S. Cl. 343—901 9 Claims

1. In a manually operated telescoping antenna assembly having a plurality of nested hollow telescoping tubular sections, an upper terminal section having an upper end and a lower end, and a lower guide tube mountable to a substantially planar base member into which the antenna sections receivably retract and from which said antenna sections are manually

extensible, the improvement which comprises in operative combination therewith of:

(a) a continuous one piece vibration damping non-electrically conductive core member disposed inside said hollow telescoping sections;

(b) said lower guide tube is mounted below the plane of said base member so that said antenna sections are manually retracted to a position substantially flush with said base member plane;

(c) said vibration damping core member extending continuously from said upper terminal section into said lower guide tube;

(d) said core member:

(i) is fixed adjacent an upper end thereof to the lower end of said upper antenna terminal section;

(ii) terminates in said guide tube; and

(iii) is fixed at a lower end thereof to said guide tube;

(e) said continuous vibration damping core member is formed in a generally helical spiral having a large spiral diameter portion oriented to be received in said guide tube, said vibration damping core member maintaining a helical spiral configuration in all retracted and extended positions;

(f) said core member being of sufficient length and flexibility:

(i) to permit said vibration damping core member to move loosely, and to be extended and retracted, without eigen vibration properties in a helical spiral configuration during extension from said guide tube and retraction of said antenna sections; and

(ii) to touch each of said telescoping tubular sections non-continuously but in at least one place per antenna section when extended in order to dampen motion and wind-induced eigen vibrations of said antenna sections, to reduce transmission of said vibrations as noise to a base member to which said antenna assembly is mounted, and to reduce propagation of noise vibrations by said base member to which said antenna assembly is mounted; and

(g) said core member being of insufficient length and of sufficient flexibility, and disposed entirely within said telescoping sections and said guide tube, to exclude power raising of said antenna sections by power drive means acting on said flexible vibration damping core member, while permitting manual raising and lowering of said antenna by lifting or pushing, respectively, on said upper terminal section.

4,920,355

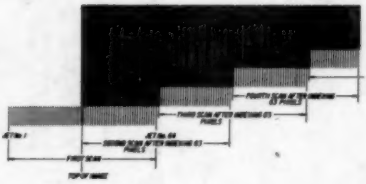
INTERLACE METHOD FOR SCANNING PRINT HEAD SYSTEMS

James A. Katerberg, Kettering, Ohio, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 31, 1989, Ser. No. 386,746

Int. Cl.[5] G01D *15/16;* **H04N** *1/21*

U.S. Cl. 346—1.1 **5 Claims**



1. An improved method of printing using a print head having a linear array of print elements adapted to be indexed in a direction parallel to the line of the array line to address successive groups of rows of print media pixels moved therepast in a direction generally perpendicular to the array direction, said method comprising:

(a) selecting such print head to comprise an even number (A) of print elements located in a linear array and having with a uniform 2 pixel spacing;

(b) alternately indexing the print head, in a direction parallel to the array direction by the amounts of A−1 and A+1 pixels; and

(c) in correspondence with such alternate indexings respectively printing on even or odd rows of the print medium in accord with image information.

4,920,356

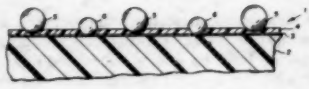
ELECTROGRAPHIC RECORDING RECEIVER

William K. Goebel, and David M. Rakov, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 19, 1988, Ser. No. 286,190

Int. Cl.[5] G01D *9/00, 15/10;* **B05D** *5/12;* **B32B** *3/00*

U.S. Cl. 346—1.1 **14 Claims**



1. An electrographic recording receiver for use in a process where styli in a writing head deposit electric charges on an electrographic receiver comprising

(A) a substrate that comprises a conductive layer on an insulating support;

(B) a dielectric layer having an image area on said conductive layer;

(C) conductive particles that are embedded in said image area of said dielectric layer, are in contact with said conductive layer and extend through the surface of said dielectric layer to provide an electrical path between a ground and said conductive layer through said conductive particles; and

(D) insulating particles that are embedded in said image area of said dielectric layer and extend through the surface of said dielectric layer beyond said conductive particles to provide a substantially uniform distance between said styli and said dielectric layer.

14. A method of making an electrographic recording receiver comprising

(A) depositing on an insulating support a conductive layer containing conductive particles that extend through the surface of said conductive layer, and

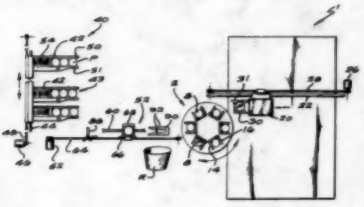
(B) depositing a dielectric layer on said conductive layer at a thickness such that said conductive particles protrude through the surface of the dielectric layer, said dielectric layer containing insulating particles that also protrude through its surface.

4,920,357

UNATTENDED REPLACEMENT OF PLOTTER PENS

David A. Johnson, Escondido, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 29, 1989, Ser. No. 373,415
Int. Cl.[5] G01D 9/30
U.S. Cl. 346—49 6 Claims



1. In a computer driven plotter pen apparatus having a moveable plotter pen carriage which has means thereon for releaseably holding a plotter pen in drafting position, the improvement comprising apparatus for the unattended replacement of a spent plotter pen comprising:

(a) a pen turret mountable on said plotter pen apparatus, said turret having a plurality of pen slots to hold a variety of usable plotting pens, each of said plurality of pen slots having gripping means mounted therein to hold a pen and said pen gripping means being moveable, upon rotation of said turret, between a first pen transfer position and a second pen transfer position;

(b) means for rotating said turret for moving said pen slots and pen gripping means therein between said first and second positions;

(c) a plurality of pen magazines each being capable of holding a plurality of fresh plotting pens and having gripping means at one end thereof to hold a fresh pen in a third pen transfer position, and means for moving fresh pens in said magazine towards said third pen transfer position into said pen gripping means;

(d) means for moving said plurality of pen magazines to selectively position the gripping means of one of said magazines of pens at said third pen transfer position;

(e) a pen transfer carriage and means for moving said pen transfer carriage between said second pen transfer position for transferring pens to and from said turret, and said third pen transfer position for receiving a fresh pen from one of said pen magazines, said pen transfer carriage having pen gripping means thereon; and

(f) a spent pen discharge gate disposed between said turret and said magazines for engaging a spent pen in said transfer carriage and releasing said spent pen from said transfer carriage as said transfer carriage moves toward said magazines;

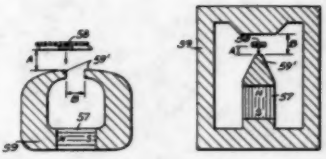
said pen gripping means on said transfer carriage being engageable with said pen gripping means on said turret when both said turret and said transfer carriage are in said second pen transfer position for transferring a pen therebetween in either direction and being engageable with said pen gripping means on said magazine when said pen carriage is in said third pen transfer position for transferring a pen from said magazine to said transfer carriage, and said means on the plotter pen carriage which releaseably hold a pen in drafting position when said pen gripping means on said turret is in said first pen transfer position for transferring pens between said turret and said plotter pen carriage in either direction.

4,920,358

IMPRINTING APPARATUS

Katsumori Takei, Nagano, Japan, assignor to Seiko Epson Corporation, a Japanese Corporation, Tokyo, Japan

Continuation of Ser. No. 222,450, Feb. 22, 1988, which is a continuation of Ser. No. 841,925, May 20, 1986, Pat. No. 4,769,649. This application Jun. 23, 1989, Ser. No. 370,951
Claims priority, application Japan, Mar. 22, 1985, 60-57960; Mar. 22, 1985, 60-57961; Mar. 22, 1985, 60-57962
Int. Cl.[5] G01D 15/00
U.S. Cl. 346—74.2 63 Claims



1. An imprinting apparatus for printing on a transfer medium by transferring thermoplastic magnetic ink having a recording portion and a non-recording portion to said transfer medium, comprising:

heating means for controlling application of thermal energy to the recording portion of said thermoplastic magnetic ink; and

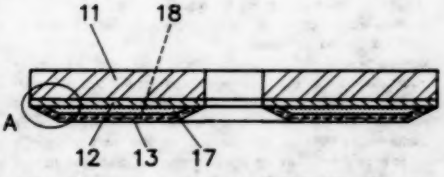
magnetic force means for applying magnetic force to the recording portion of said ink being transferred to said transfer medium by said magnetic force, the magnetic force means including a first magnetic force member and a second magnetic force member, the thermoplastic magnetic ink positioned intermediate said first and second magnetic force members.

4,920,359

OPTICAL INFORMATION RECORDING MEDIUM HAVING PROTECTIVE LAYER

Yuji Arai; Emiko Hamada; Yuaki Shin, and Takashi Ishiguro, all of Tokyo, Japan, assignors to Taiyo Yuden Co., Ltd., Tokyo, Japan

Filed Jul. 3, 1989, Ser. No. 376,213
Claims priority, application Japan, Nov. 23, 1987, 62-294965
Int. Cl.[5] G01D 15/24, 9/00
U.S. Cl. 346—137 7 Claims



1. An optical information recording medium comprising:

a substrate;

an optical recording layer formed over the surface of the substrate;

a protective layer covering the optical recording layer, said protective layer having incorporated therein antireflec-

tion means for preventing the reflection of a laser beam, said antireflection means being means for absorbing the laser beam in combination with means for scattering the laser beam; and

a buffer layer made of gaseous matter interposed between the optical recording layer and the protective layer.

4. An optical information recording medium comprising:

a substrate;

an optical recording layer formed over the surface of the substrate;

a protective layer covering the optical recording layer; and

a buffer layer interposed between the optical recording layer and the protective layer, said buffer layer having incorporated therein antireflection means for preventing the reflection of a laser beam, said antireflection means being two or more members selected from the group consisting of means for absorbing the laser beam, means for scattering the laser beam and means for transmitting the laser beam.

4,920,360

LIQUID EJECTION RECORDING UNIT AND LIQUID EJECTION RECORDING APPARATUS

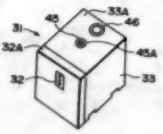
Koji Terasawa, Mitaka; Akira Miyakawa, Tanashi, and Takehiko Kiyohara, Zama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 56,347, May 27, 1987, Pat. No. 4,785,314, which is a continuation of Ser. No. 709,298, Mar. 7, 1985, abandoned. This application Apr. 6, 1988, Ser. No. 178,379

Claims priority, application Japan, Mar. 14, 1984, 59-48683; Mar. 14, 1984, 59-48685; Mar. 14, 1984, 59-48686

Int. Cl.[5] G01D *15/18*

U.S. Cl. 346—140 R **27 Claims**



1. A liquid ejection recording unit comprising:

ink discharge means including means defining an orifice and means for discharging ink from said orifice;

ink containing means for containing ink to be supplied to said ink discharge means; and

communication means provided on said ink containing means and including a movable member formed in a wall of said ink containing means for causing the interior of said ink containing means to communicate with the outer atmosphere by breaking away from said wall to form a hole in said wall having a predetermined shape when said movable member is moved by an external force acting thereon, wherein said communication means further has a portion of less strength than remaining portions of said containing means so that communication between an air layer in said containing means and the outer atmosphere can be provided by opening said communication means by the external force.

4,920,361

IMAGE RECORDING METHOD AND APPARATUS THEREFOR

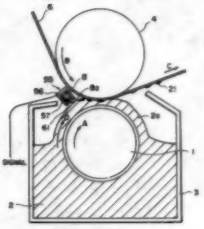
Kohzoh Arahara; Hiroshi Fukumoto, both of Kawasaki; Toshiya Yuasa, Mitaka; Toshikazu Ohnishi, Atsugi; Fumitaka Kan, deceased, late of Tokyo (by Akiko Kan, legal successor); Hiroshi Tanioka; Norihiko Koizumi, both of Yokohama, and Noboru Tohyama, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 24, 1988, Ser. No. 214,374

Claims priority, application Japan, Jun. 26, 1987, 62-157574; Sep. 3, 1987, 62-219087

Int. Cl.[5] C01D *15/16*; C09D *11/02*

U.S. Cl. 346—140 R **16 Claims**



1. An image recording method, comprising:

providing an ink which is substantially non-adhesive and capable of being imparted with an adhesiveness when subjected to a pH change;

causing a pattern of pH change corresponding to a given image signal on a layer of said ink formed on an ink-carrying member to form an adhesive pattern of the ink corresponding to the image signal; and

transferring the adhesive pattern of the ink to a transfer-receiving medium to form thereon an ink pattern corresponding to the adhesive pattern.

4,920,362

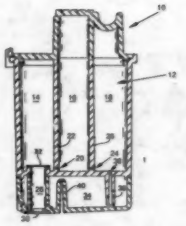
VOLUMETRICALLY EFFICIENT INK JET PEN CAPABLE OF EXTREME ALTITUDE AND TEMPERATURE EXCURSIONS

Bruce Cowger, Corvallis, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 16, 1988, Ser. No. 286,567

Int. Cl.[5] G01D *15/18*

U.S. Cl. 346—140 R **13 Claims**



1. An ink jet pen comprising:

an ink reservoir comprised of a plurality of interconnected ink storage chambers;

a drop generator coupled to one of said chambers; and

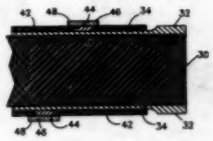
accumulator means coupled to another of said chambers for accumulating ink expelled from the reservoir by the expansion of air therein.

4,920,363

METHOD OF MANUFACTURING ELECTROSTATIC PRINTER HEADS

James R. Hack, Villa Park, Calif., assignor to Calcomp Inc., Anaheim, Calif.

Filed Jan. 4, 1989, Ser. No. 293,823
Int. Cl.[5] G01D 15/00
U.S. Cl. 346—155 2 Claims



1. The method of manufacturing an electrostatic printhead for a wide electrostatic plotter comprising the steps of:

(a) forming a pattern of parallel, spaced, first printwire traces and connective conductors on one side of a first insulative substrate with ends of the first printwire traces terminating in a common plane defining a printface of a first printhead portion;

(b) adding additional conductive material to the first printwire traces adjacent the common plane to give them a substantially square cross-section;

(c) forming a pattern of parallel, spaced, second printwire traces and connective conductors on a second side of the first insulative substrate with ends of the second printwire traces terminating in the common plane defining the printface of the first printhead portion;

(d) adding additional conductive material to the second printwire traces adjacent the common plane to give them a substantially square cross-section;

(e) trimming the ends of the first and second printwire traces and the first substrate thereunder along a straight line adjacent the common plane to form the printface of the first printhead portion;

(f) forming a pattern of parallel, spaced, third printwire traces and connective conductors on one side of a second insulative substrate with ends of the third printwire traces terminating in a common plane defining a printface of a second printhead portion;

(g) adding additional conductive material to the third printwire traces adjacent the common plane to give them a substantially square cross-section;

(h) forming a pattern of parallel, spaced, fourth printwire traces and connective conductors on a second side of the second insulative substrate with ends of the fourth printwire traces terminating in the common plane defining the printface of the second printhead portion;

(i) adding additional conductive material to the fourth printwire traces adjacent the common plane to give them a substantially square cross-section;

(j) trimming the ends of the third and fourth printwire traces and the second substrate thereunder along a straight line adjacent the common plane to form the printface of the second printhead portion;

(k) positioning the first and second printhead portions side by side in a first common plane, with their printfaces in a second common plane and with their adjacent first, second, third, and fourth printwire traces registered with respect to one another;

(l) bonding the first and second printhead portions together to form a single, lengthened, combined printhead; and,

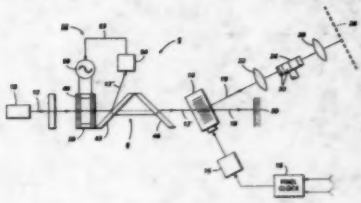
(m) encasing the combined printhead in a potting material with the printfaces of the first and second printhead portions exposed.

4,920,364

LIQUID CRYSTAL DYNAMIC ATTENUATOR FOR LASER PRINTERS

John R. Andrews, Fairport; Werner E. Haas, Webster, both of N.Y., and Jean-Michel Guerin, Glendale, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed May 10, 1989, Ser. No. 349,667
Int. Cl.[5] G01D 15/00
U.S. Cl. 346—160 10 Claims



1. In a raster output scanner having a laser providing a high intensity beam, and a modulator for modulating the beam in response to an image signal input to provide an image beam for exposing a recording member, a variable attenuator upstream of said modulator for controlling the intensity of said beam, comprising:

(a) a liquid crystal cell for imparting controlling alteration of the polarization of said beam;

(b) a source of electrical potential for generating an external electric field across said crystal cell to vary the degree of alteration of the polarization of said beam by said crystal cell; and

(c) a polarization analyzer for detecting the degree of alteration of the polarization of said beam effected by said crystal cell, said analyzer including

(1) a polarizing beam splitter following said crystal cell for separating said beam into primary and secondary beams, and

(2) control means responsive to the intensity of said secondary beam for controlling said source of electrical power to vary the electrical field across said crystal cell whereby to vary the degree of rotation of said beam by said crystal cell so as to maintain the intensity of said beam substantially constant.

4,920,365

ELECTRONIC DIGITAL TIMEPIECE HAVING A SEPARATE KEY FOR CONTROLLING THE SWITCHING OF THE DISPLAY FROM STANDARD TO DAYLIGHT SAVINGS TIME

Juergen Marx, and Artur Weich, both of Nuremberg, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 12, 1989, Ser. No. 336,775
Claims priority, application Fed. Rep. of Germany, Apr. 25, 1988, 3813922
Int. Cl.[5] G04C 17/00
U.S. Cl. 368—242 2 Claims

1. An electronic digital timepiece having a display for the digital display of the actual time-of-day, said display having a colon located between an hours display and a minutes display and flashing in a seconds cycle, said timepiece further having a plurality of keys to cyclically shift the hours and minutes and to adjust any additional data in said display, the timepiece comprising:

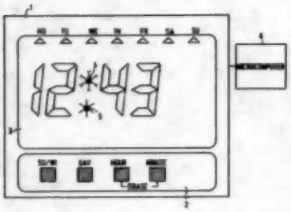
(a) a separate key for controlling the switching of the display from daylight saving time to standard time and from standard time to daylight saving time;

(b) said colon serving as a means for displaying both daylight saving time and standard time by further comprising:

(i) a first symbol indicating daylight saving time associated with one point of the colon;

(ii) a second symbol indicating standard time associated with the other point of the colon wherein one of said first and second symbols is selected and appears continuously on the display;

(c) said selected symbol functioning to only appear on the display for a period of time upon recalling the selected symbol;



(d) said timepiece further functioning wherein upon resetting the display, the first and second symbols flash without the colon points, and further wherein, after activating the separate key for daylight saving time or standard time, the selected symbol appears statically on the display and the colon points flash; and

wherein the actual time-of-day can only be adjusted after the selected symbol is entered.

4,920,366

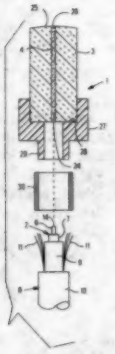
CONSTRUCTION OF AN OPTICAL FIBER WITH A CONNECTOR

Terry P. Bowen, Etters; Emil W. Deeg, Lemoyne; James G. Helm, and Larry R. Stauffer, both of Camp Hill, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed May 31, 1989, Ser. No. 359,190

Int. Cl.[5] G02B *6/36*

U.S. Cl. 350—96.20 **20 Claims**



1. A connector for an optical fiber comprising, an alignment body, and a length of optical waveguide in the alignment body for optical coupling with an external optical fiber, wherein the improvement comprises;

the alignment body is unitary with the length of optical waveguide, and the length of optical waveguide is shortened while unitary with the alignment body to provide a passage in the alignment body receiving therein an optical fiber for optical coupling with said length of optical waveguide.

4,920,367

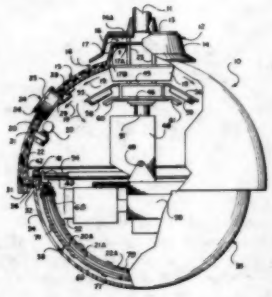
BALLISTIC RATED CAMERA HOUSING AND METHOD FOR FORMING

Raymond V. Pagano, P.O. Box 802, Lithonia, Ga. 30058

Division of Ser. No. 64,401, Jun. 22, 1987, Pat. No. 4,796,039. This application Dec. 5, 1988, Ser. No. 280,305

Int. Cl.[5] G03B *29/00*

U.S. Cl. 354—81 **1 Claim**



1. A housing for a surveillance camera said housing including an upper dome, a boss extending centrally upwardly from said upper dome and defining openings therethrough, a shroud generally covering and spaced above said boss for allowing air flow between said shroud and said boss, a filter housing in said boss covering said openings for providing a flow of filtered air through said boss and into said housing, and a blower mounted within said housing below said boss for dispersing said filtered air throughout said housing, and further including a camera motor disposed below said blower, said blower acting to cool said camera motor, said upper dome being hemi-spherical, said boss being located at the upper polar position on the hemisphere so that warm air rises towards said boss and said blower, said blower being so constructed and arranged as to direct air along the hemi-spherical interior surface of said upper dome so that said filtered air is mixed with said warm air and dispensed in said housing.

4,920,368

BUILT-IN FLASH SYSTEM

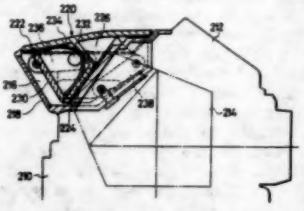
Akihiro Arai, and Tetsuji Sheno, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 143,488, Jan. 13, 1988, abandoned. This application Feb. 3, 1989, Ser. No. 306,436

Claims priority, application Japan, Jan. 13, 1987, 62-5815; Jan. 13, 1987, 62-5816; Jan. 13, 1987, 62-5817; Feb. 6, 1987, 62-16209[U]; Feb. 9, 1987, 62-27898; Feb. 9, 1987, 62-27899

Int. Cl.[5] G03B *15/05*

U.S. Cl. 354—145.1 **5 Claims**



1. In a built-in flash system including a housing chamber provided in the upper front of a penta-house of a finder optical system, and a casing provided in said housing chamber and having a flashlight emitter arranged so as to be movable between a projecting position where said casing is projected for

light emission and a housing position where said casing is housed in said housing chamber,

a built-in flash pop-up mechanism characterized in that said casing is arranged to be moved between said projecting position and said housing position by at least one four-point linkage mechanism disposed at a side of said built-in flash system, said four-point linkage mechanism being constituted by a pair of front and rear turning levers, said pair of front and rear turning levers being pivoted at their respective one ends to a corresponding side of said casing.

4,920,369

LENS POSITION CONTROL DEVICE

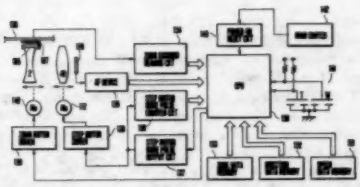
Naoya Kaneda; Hiroyuki Wada; Mashide Hirasawa, and Hirofumi Suda, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 2, 1989, Ser. No. 346,630

Claims priority, application Japan, May 6, 1988, 63-109966; Jun. 16, 1988, 63-149201

Int. Cl.[5] G03B 3/00

U.S. Cl. 354—400 13 Claims



1. A lens position control device comprising:

(a) a first lens group movable along an optical axis for varying an image magnification;

(b) a second lens group for performing (1) a function of compensation when varying the image magnification, and (2) a focusing function;

(c) detecting means for detecting positions of said first lens group and said second lens group;

(d) a memory having stored therein moving speed information of said second lens group, said moving speed of said second lens group being stored in a plurality of kinds of moving speed information according to the positions of said first lens group and said second lens group and a predetermined moving speed of said first lens group; and

(e) control means for controlling movements of said first and said second lens groups in response to actuation for causing the image magnification to be varied, said control means selecting a specific moving speed from said memory depending on the positions of said first and said second lens groups detected by said detecting means, and causing said second lens group to move on the basis of said specific moving speed, and said control means causing said first lens group and said second lens group to move at almost the same time.

4,920,370

PHOTO SIGNAL PROCESSING APPARATUS

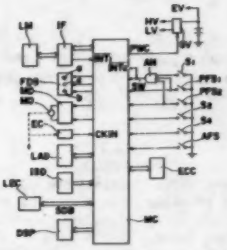
Nobuyuki Taniguchi, Nishinomiya; Toshihiko Ishimura, Habikino; Norio Ishikawa, Osaka; Reiji Seki, Sakai, and Yasuaki Akada, Osaka, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 24, 1987, Ser. No. 29,755

Claims priority, application Japan, Mar. 25, 1986, 61-66670; Mar. 25, 1986, 61-66671; Mar. 25, 1986, 61-66672; Mar. 25, 1986, 61-66673

Int. Cl.[5] G03B 3/00

U.S. Cl. 354—402 6 Claims



1. A photo signal processing apparatus which comprises:

a light receiving means of charge accumulation type for outputting data corresponding to a condition of light received thereby;

a data processing means for applying a predetermined processing to the data outputted from the light receiving means;

an accumulation initiating means for causing the light receiving means to initiate a charge accumulating operation;

an accumulation interrupting means for interrupting the charge accumulating operation of the light receiving means;

a count means for counting a time passed during a period subsequent to the start of the charge accumulating operation of the light receiving means and until the termination of the charge accumulating operation of the light receiving means; and

a control means for activating the accumulation initiating means at a timing required to interrupt the charge accumulating operation of the light receiving means at the time of termination of the data processing performed by the data processing means.

4,920,371

CAMERA CONTROL DEVICE

Kiyotaka Kaneko, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 27, 1988, Ser. No. 187,039

Claims priority, application Japan, Apr. 27, 1987, 62-101989; May 6, 1987, 62-108859; May 8, 1987, 62-110834

Int. Cl.[5] G03B 7/00

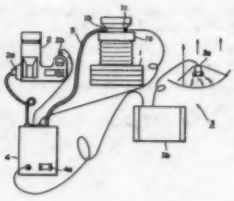
U.S. Cl. 354—410 3 Claims

1. A camera control device for controlling the shutter release operations of a master camera and an electronic still camera to be synchronous with emission of a strobe light from a strobo device, comprising:

a shutter release switch for controlling the opening of shutters of said master camera and said electronic still camera when actuated;

means for receiving a shutter full-open signal from said master camera and said electronic still camera when their shutters are respectively fully opened and outputting a

strobo sync signal when both shutter full-open signals coincide; and

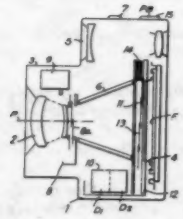


means for supplying said strobo sync signal to said strobo device to cause emission of said strobe light.

4,920,372
CAMERA

Tadashi Nakagawa; Nobuo Shinozaki; Hiroyuki Koizumi; Hiroshi Yamazaki; Hiroyuki Saito; Katsuhiko Matsushita, and Miyoshi Tanikawa, all of Chiba, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan

Filed Jul. 7, 1989, Ser. No. 376,722
Claims priority, application Japan, Jul. 11, 1988, 63-172188
Int. Cl.[5] G03B *7/08, 9/08*
U.S. Cl. 354—412 **21 Claims**

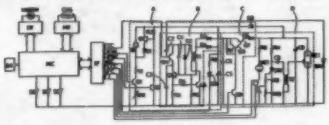


1. A camera having a lens shutter for performing a programmed exposure operation and a diaphragm-adjusting operation, and a focal-plane shutter, said camera comprising:
(a) selector means for selecting one of the following modes of operation:
(i) a lens shutter mode in which the lens shutter is operated as a programmed shutter, and
(ii) a focal-plane shutter mode in which the shutter speed is controlled by the focal-plane shutter and an aperture is controlled by the lens shutter;
(b) first driving means for controlling one of the following:
(i) a programmed exposure value of the lens shutter, and
(ii) the size of said aperture;
(c) said first driving means including:
(i) a motor, and
(ii) an actuating member driven by said motor, said actuating member having first cam means for controlling the programmed exposure value of the lens shutter in response to rotation of the motor in a first direction, and second cam means for controlling the size of the aperture in response to rotation of the motor in a second, opposite direction;
(d) second driving means for controlling the time in which the focal-plane shutter mode is operated; and
(e) sequential control means for controlling said first and second driving means.

4,920,373
DEVICE FOR DRIVING SHUTTER

Shinji Tominaga, and Takeshi Hashimoto, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jun. 3, 1988, Ser. No. 202,023
Claims priority, application Japan, Jun. 4, 1987, 62-141073; Jun. 4, 1987, 62-141074; Jun. 4, 1987, 62-141075
Int. Cl.[5] G03B *7/096*
U.S. Cl. 354—457 **4 Claims**

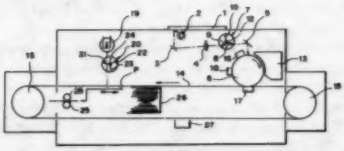


1. A driving device for use in a camera comprising:
piezo-electric means displaceable by applying thereto an electrical voltage;
driving means for driving said piezo-electric means by applying an electrical voltage to the piezo-electric means;
short-circuiting means connected in parallel to said piezo-electric means for short-circuiting said piezo-electric means;
controlling means for controlling said driving means and said short-circuiting means so as to short-circuit said piezo-electric means except when said driving means is in an active state; and
shutter means driven by said piezo-electric means to be opened and closed for performing an exposure operation wherein said controlling means controls the driving means and thus the piezo-electric means, thereby controlling an exposure operation.

4,920,374
PICTURE RECORDING APPARATUS

Kazuo Sangyoji; Takemi Yamamoto, both of Nagoya; Tsugio Okamoto, Kani; Naoyuki Hatta, Gamagori; Yuji Asano, Nagoya; Kenji Sakakibara, Ichinomiya; Hitoshi Nakai, Nagoya; Michitoshi Akao, Nagoya; Jun Sakai, Nagoya, and Yumio Matsumoto, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Division of Ser. No. 50,313, May 14, 1987, Pat. No. 4,810,614.
This application Dec. 12, 1988, Ser. No. 283,223
Claims priority, application Japan, May 19, 1986, 61-113872; May 19, 1986, 61-113873; May 19, 1986, 61-113876; May 19, 1986, 61-113877; Aug. 1, 1986, 61-182529; Nov. 20, 1986, 61-277595
Int. Cl.[5] G03B *27/32, 27/52*
U.S. Cl. 355—27 **9 Claims**



1. An apparatus for recording a picture onto a photosensitive and pressure-sensitive sheet, comprising:
forming means for forming plural mask original forms based on picture information entered through an input means which electronically emulates said picture so that said mask original forms have light-transmitting portions and non-light-transmitting portions corresponding to picture information of said original picture;
positioning means for accurately adjusting each of said plu-

ral mask original forms with respect to the photosensitive and pressure-sensitive sheet;

exposure means for exposing said photosensitive and pressure-sensitive sheet through said mask original forms to light of plural different wavelengths whereby to produce a latent image of said picture on said photosensitive and pressure-sensitive sheet; and

pressure-fixing means for pressing said photosensitive and pressure-sensitive sheet having said latent image thereon to thereby develop said latent image.

4,920,375

IMAGING DEVICE

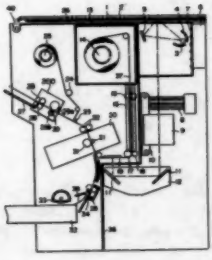
Michitoshi Akao, Nagoya; Kenji Sakakibara; Tokunori Katoh, both of Ichinomiya; Yukichi Sawaki, Gifu; Takakuni Sonoda, and Makoto Suzaki, both of Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Filed Mar. 15, 1989, Ser. No. 324,292

Claims priority, application Japan, Mar. 16, 1988, 63-62814; Mar. 19, 1988, 63-36762[U]; Sep. 8, 1988, 63-225312

Int. Cl.[5] G03B *27/32*

U.S. Cl. 355—27 **8 Claims**



1. An imaging device employing a continuous-form recording medium coated with a plurality of photo and pressure sensitive microcapsules, each of said microcapsules enveloping therein a chromogenic material and a photo-sensitive resin, said imaging device comprising:

exposure means for exposing an optical image on said recording medium;

a pair of pressure-developing rollers, adapted to be brought into and out of contact with each other, for pressurizing the exposed recording medium to develop a visible image;

drive means for rotating a first roller of the pressure-developing rollers;

shift means for shifting a second roller of the pressure-developing rollers toward or away from the first roller of the pressure-developing rollers; and

control means for controlling said drive means and said shift means in such a fashion that said first roller of the pressure-developing rollers is kept rotating by said drive means when said second roller of the pressure-developing rollers is shifted out of contact with said first roller.

4,920,376

PHOTO-SENSITIVE RECORDING MEDIUM CARTRIDGE FOR USE WITH IMAGE RECORDING APPARATUS

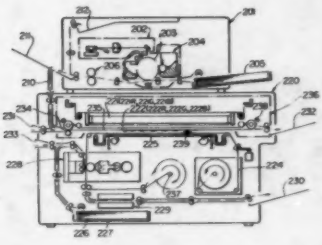
Takemi Yamamoto; Jun Sakai, and Takakuni Sonoda, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

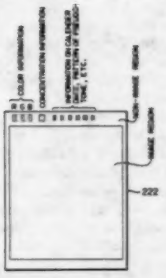
Filed Jun. 30, 1988, Ser. No. 213,350

Claims priority, application Japan, Jul. 7, 1987, 62-104310[U]; Jul. 7, 1987, 62-104311[U]; Jul. 17, 1987, 62-110375[U]

Int. Cl.[5] G03B *27/80*

U.S. Cl. 355—38 **8 Claims**





1. A color image recording apparatus utilizing a photo-sensitive recording medium and a set of a plurality of color-decomposed mask original plates, each mask original plate being provided with image information containing data as to what color the mask original plate corresponds, which comprises:

reader means for successively reading out the data contained in the image information provided respectively, on said mask original plates, to generate signals indicative of the respective data;

said mask original plates being successively superposed upon said photo-sensitive recording medium;

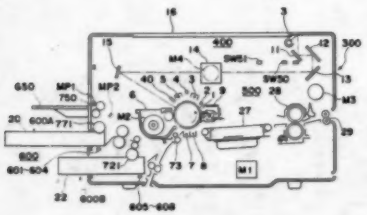
exposure means operative in response to said signals from said reader means for exposing said photo-sensitive recording medium successively to lights with their respective wavelengths in conformity respectively with said mask original plates which are successively superposed upon said photo-sensitive recording medium, thereby forming color-decomposed latent images corresponding to the respective mask original plates, onto said photo-sensitive recording medium; and

developing means for developing a color image in accordance with said color-decomposed latent images.

4,920,377
COPYING APPARATUS CAPABLE OF AUTOMATICALLY SELECTING COPY PAPER SIZE AND CONTROL METHOD FOR CONTROLLING OPERATION OF COPYING APPARATUS

Masazumi Ito, and Tomoji Murata, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 8, 1989, Ser. No. 308,181
Claims priority, application Japan, Feb. 10, 1988, 63-29869; Feb. 15, 1988, 63-32491; Feb. 15, 1988, 63-32492; Feb. 15, 1988, 63-32493; Feb. 18, 1988, 63-36387; Feb. 18, 1988, 63-36388; Feb. 18, 1988, 63-36389; Feb. 18, 1988, 63-36390
Int. Cl.[5] G03B 27/52
U.S. Cl. 355—55 18 Claims

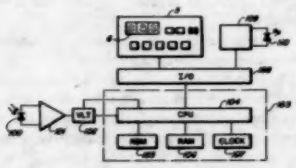


1. A copying apparatus comprising:
image forming means capable of forming an image of an original document at a plurality of copying magnifications which are correlated with predetermined copy paper sizes, respectively;
a plurality of paper feeding means, each of which accommodates the copy paper sheets the sizes of which are different from each other;
first selection means for manually selecting one of the copying magnifications; and
second selection means for automatically selecting one of said paper feeding means in which the copy paper sheets having the size correlated with the copying magnification selected by said first selection means are accommodated, wherein the selection of said paper feeding means is effected, regardless of a size of the original document, in response to the selection of the copying magnification.

4,920,378
METHOD AND A MEASURING APPARATUS FOR DETERMINING THE EXPOSURE TIME IN PHOTOGRAPHIC COPYING

Alex Vinatzer, Brixen/Milland, Italy, assignor to Durst Phototechnik GmbH, Bozen, Italy

Filed Dec. 14, 1988, Ser. No. 284,077
Claims priority, application Italy, Dec. 16, 1987, 4858 A/87
Int. Cl.[5] G03B 27/80
U.S. Cl. 355—68 9 Claims

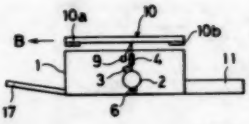


1. A method for determining the exposure time in photographic copying by means of photographic enlarging or copying apparatuses, the photographic enlarging or copying apparatus having a copying light source of variable intensity and being adapted to form a projected picture, in a copying plane, of an original to be copied, comprising in combination the steps of measuring the light intensity of the projected picture in the copying plane at a plurality of different measuring points of the projected picture, for a given copying light source intensity, to provide a corresponding light measuring value for each of the different measuring points, forming a mean value of the light measuring values of said plurality of different measuring points, determining an exposure time for said given copying light source intensity in accordance with said mean value, measuring a continuous light measuring value at a selected one of said measuring points after forming the mean value, and continuously modifying the exposure time resulting from the mean value in accordance with a proportional action factor which expresses the relationship between the light measuring value entered into the formation of the mean value at a selected one of said measuring points and the continuous light measuring value at the selected measuring point.

4,920,379
IMAGE FORMING APPARATUS WITH A COMMON POWER SOURCE FOR VARIOUS CHARGERS AND A SIMPLIFIED ARRANGEMENT FOR SUBJECTING THE PHOTOSENSITIVE DRUM TO BLANK EXPOSURE

Yasushi Nakanishi, Yamatokoriyama; Takahiro Fukunaga, and Manabu Matsumoto, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 31, 1989, Ser. No. 359,276
Claims priority, application Japan, May 31, 1988, 63-135123
Int. Cl.[5] G03G 13/00, 15/00
U.S. Cl. 355—210 4 Claims



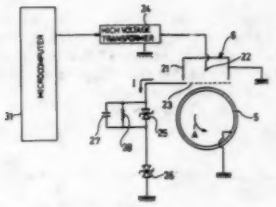
1. An image forming apparatus which comprises, in a main body thereof, a light source, a photoreceptor, charging means for electrostatically charging the surface of the photoreceptor, developing means for supplying toner particles to the surface of the photoreceptor, transferring means for transferring onto a copying sheet a toner image formed on the surface of the photoreceptor, and high-voltage applying means for applying a high voltage trigger to both said charging means and said transferring means simultaneously, said apparatus being designed to execute original scanning as an original glass plate is moved with respect to said main body, characterized in comprising a reflecting unit for reflecting the light from the light source to illuminate the surface of the photoreceptor at an area between the charging means and the developing means, said reflecting unit being disposed at a position corresponding to the trailing end of the original glass plate in its forward movement for original scanning, and control means for causing the original glass plate to stop at an original scanning completing station after the end of the original scanning until the end of the stage of image transferring by the transferring means and for causing the light source to continue light emission so that the charge which is applied to a non-image area of the photoreceptor surface after the end of the original scanning until the end of the stage of image transferring is removed by the light from the light source that is reflected by said reflecting unit to illuminate the surface of the photoreceptor.

4,920,380

SURFACE POTENTIAL CONTROL DEVICE OF PHOTOCONDUCTIVE MEMBER

Masahide Ueda, and Yoshihiro Hanada, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 29, 1988, Ser. No. 226,056
Claims priority, application Japan, Jul. 31, 1987, 62-193085; Oct. 23, 1987, 62-268892
Int. Cl.[5] G03G *15/02, 21/00*
U.S. Cl. 355—219 14 Claims



7. An image forming apparatus, comprising: photoconductive drum;

means for charging the surface of the photoconductive drum;

means for forming electrostatic latent image on the photoconductive drum by exposing images;

means for developing the electrostatic latent image;

means for actuating the charging means; and

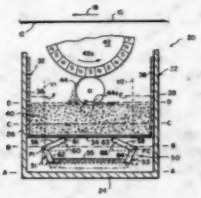
control means for controlling output of the charging means to start with a lower value than a predetermined value according to the time during which the charging means suspended its operation and to gradually make the value to match up to the predetermined value.

4,920,381

TONER CONTAINER LIFT MECHANISM

Gregory P. Mahoney, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 3, 1989, Ser. No. 293,833
Int. Cl.[5] G03G *15/06*
U.S. Cl. 355—260 10 Claims



7. A mechanism for lifting and lowering a toner container in an electrostatographic development apparatus, the mechanism comprising:

(a) a pair of pivotable cams mounted spaced apart for supporting the toner container, said pair of cams having a raised position and a lowered position, and each said cam having (i) a first portion including a first distal end and a flat side for contacting the toner container, and (ii) a second portion including a second distal end, said first and second portions of each said cam forming an elbow, and each said cam including a pivot point at each said elbow respectively; and

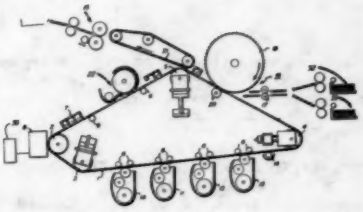
(b) a horizontal spring for automatically lifting said pair of cams to said raised position thereby automatically lifting the toner container therewith, said spring being connected to each said cam at said second distal end directly below said pivot point thereof, and said spring, as connected, cooperating with said flatsides of said cams to automatically lift and lower the toner container throughout with a constant momentum.

4,920,382

FIXING METHOD FOR RESIN BASED SHEETS

Borden H. Mills, and David F. Cahill, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 25, 1988, Ser. No. 223,829
Int. Cl.[5] G03G *15/20*
U.S. Cl. 355—284 7 Claims



1. A process of fixing color toner images carried on a resin based sheet using a fixing device of the type having at least one roller having a surface which contacts the toner image during fixing and to which a release liquid is applied by a release liquid applying means to prevent the offset of toner to the roller surface, said process including the steps of

applying release liquid to said roller surface, using a wick having a fabric surface that rotates with the surface of said one roller,

terminating the application of release liquid to said surface, then contacting said surface with a sheet of material more absorbent of said liquid than said resin based sheet, and

then carrying out said fixing process including the step of bringing said roller surface into contact with said toner image without recontacting the wicking roller.

4,920,383

PAPER HANDLING FOR REPETITIVE MOVEMENT OF VARIABLE LENGTH MEDIA THROUGH AN IMAGE TRANSFER STATION

William P. Cook, Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 14, 1989, Ser. No. 322,961
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—311 10 Claims

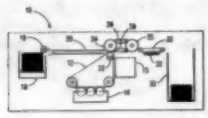
9. A method for optimizing the throughput rate of a machine which must repetitively pass cut sheets through a work station wherein said sheets may have a length within a range defined by a predetermined minimum and a predetermined maximum comprising the steps of

establishing at least first and second return paths from the work station output to its input with said first path having a length corresponding to said predetermined minimum and said second path having a length corresponding to said predetermined maximum,

determining the length of a media sheet introduced to the work station,

directing the media sheet into said first path in response to a said determining step result indicative that the media

length is equal to or less than said predetermined minimum, and



directing the media sheet into said second path in response to a said determining step result indicative that the media is of a length greater than said minimum.

4,920,384

COPYING MACHINE WITH AUTOMATIC DOCUMENT FEEDING MEANS

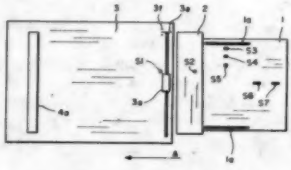
Yuji Okamoto, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 240,392, Aug. 29, 1988, abandoned, which is a continuation of Ser. No. 131,343, Dec. 9, 1987, abandoned, which is a continuation of Ser. No. 895,991, Aug. 13, 1986, abandoned. This application May 18, 1989, Ser. No. 356,669

Claims priority, application Japan, Aug. 28, 1985, 60-190202

Int. Cl.[5] G03G *21/00, 15/06*

U.S. Cl. 355—311 **12 Claims**



1. A copying machine with automatic document feeding means, said copying machine being operable selectably in a magnification priority mode of operation wherein said copying machine is operated at a specified magnification and in a paper size priority mode of operation wherein a copy is produced on a paper sheet of a specified size, said copying machine comprising

a document carrying table for placing documents thereon,

a document transportation means for sequentially and automatically transporting documents in a specified direction from said document carrying table, and

document size detecting means for detecting the size of said documents, said document size detecting means including,

a first detector means for detecting the size of a stationary document by a plurality of sensors disposed on said document carrying table,

a second detector means for detecting at least the length of a document along said specified direction as said document is transported in said specified direction by said document transporting means, and

a control means for comparing document sizes detected by said first and second detecting means and selecting a magnification value in said paper size priority mode and a copy paper size in said magnification priority mode of operation of said copying machine on the basis of document size detected by said second detecting means if document sizes detected by said first and second detecting means do not match.

4,920,385

PANEL SURFACE FLAW INSPECTION

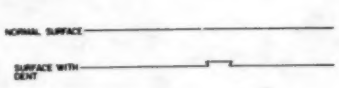
Donald A. Clarke; Rodger L. Reynolds, and Timothy R. Pryor, all of Windsor, Canada, assignors to Diffracto Ltd., Windsor, Canada

Continuation of Ser. No. 933,851, Nov. 24, 1986, abandoned, which is a division of Ser. No. 579,971, Feb. 14, 1984, Pat. No. 4,629,319. This application Apr. 6, 1989, Ser. No. 333,776

The portion of the term of this patent subsequent to Dec. 16, 2003, has been disclaimed.

Int. Cl.[5] G01N *21/88*

U.S. Cl. 356—237 **39 Claims**



1. Method for inspecting surfaces for defects comprising the steps of;

illuminating said surface with a beam of light which is projected along a beam axis to said surface and reflected therefrom,

positioning a retro reflective material comprising a plurality of minute elements such that a zone of light is produced on said retro reflective material by the reflected beam of light and such that the light forming the zone is retro reflected from said retro reflective material and is re-reflected from said surface as a cone of light centered about said beam axis,

detecting a portion of said re-reflected cone of light and forming an image of the zone on a light sensing detector having a viewing axis at an angle to said beam axis so as to be substantially unresponsive to light re-reflected along the beam axis, and

determining from said detected image of said re-reflected light any defects in said surface.

4,920,386

HIGH SPATIAL AND TIME RESOLUTION MEASURING APPARATUS

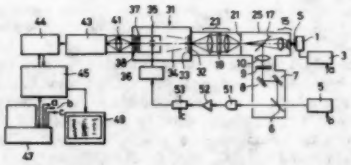
Yutaka Tsuchiya, and Yoshihiro Takiguchi, both of Shizuoka, Japan, assignors to Hamamatsu Photonics Kabushiki Kaisha, Hamamatsu, Japan

Continuation of Ser. No. 88,284, Aug. 24, 1987, abandoned. This application Apr. 19, 1989, Ser. No. 339,920

Claims priority, application Japan, Aug. 25, 1986, 61-197031

Int. Cl.[5] G01N *21/64, 21/59*

U.S. Cl. 356—417 **27 Claims**



1. A high spatial and time resolution measuring apparatus for optically measuring a desired area in a specimen, said apparatus comprising:

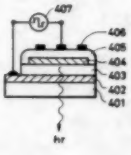
a stage for mounting the specimen thereon;
a light source for generating a first light;
first optical means for directing said first light from said light source to said specimen;
an objective means for forming the image of second light emanating form said specimen;
a width variable slit located at the image plane of said objective means for limiting the visual field of the specimen;
relay lens means for forming an image of light emanating from said width variable slit at an image plane;
a streak tube including a photocathode at the image plane of said relay lens means, said streak tube forming a streak image of an image formed by said relay lens made on said photocathode; and
a housing for shielding said first optical means, said objective means, said width variable slit, and said relay lens from ambient light.

4,920,387

LIGHT EMITTING DEVICE

Katsuji Takasu; Masafumi Sano; Hisanori Tsuda, all of Atsugi, and Yutaka Hirai, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 302,082, Jan. 26, 1989, abandoned, which is a continuation of Ser. No. 899,244, Aug. 22, 1986, abandoned. This application Sep. 13, 1989, Ser. No. 406,182
Claims priority, application Japan, Aug. 26, 1985, 60-187069; Aug. 26, 1985, 60-187741; Sep. 2, 1985, 60-194098; Sep. 3, 1985, 60-195081; Sep. 4, 1985, 60-196191; Sep. 19, 1985, 60-207021; Sep. 20, 1985, 60-209330
Int. Cl.[5] H01L *33/00*
U.S. Cl. 357—17 **25 Claims**



1. A light emitting device comprising:
a luminescent portion having at least two laminated layers comprising non-single crystalline silicon containing hydrogen atoms and having a homo-junction; and
at least a pair of electrodes connected electrically to said luminescent portion, and wherein each non-single crystalline silicon layer has an optical band gap of at least 2.0 eV and a localized level density at mid-gap no greater than $10^{16}\ cm^{-3}.eV^{-1}$.

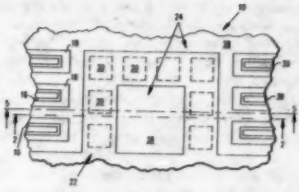
4,920,388

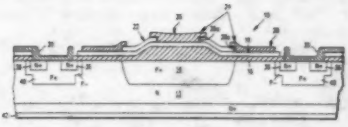
POWER TRANSISTOR WITH INTEGRATED GATE RESISTOR

Richard A. Blanchard, Los Altos, and Adrian I. Cogan, San Jose, both of Calif., assignors to Siliconix Incorporated, Santa Clara, Calif.

Continuation of Ser. No. 14,962, Feb. 17, 1987, abandoned. This application Sep. 19, 1988, Ser. No. 246,937
Int. Cl.[5] H01L *29/78, 27/02, 29/04*
U.S. Cl. 357—23.4 **3 Claims**

1. A vertical DMOS power transistor with an integrated gate resistor comprising:
a semiconductor substrate having a first region of a first conductivity type and a second region of a second, opposite conductivity type generally surrounding the first region and forming a junction with the first region;
an insulting layer on the substrate over the first region and at least a portion of the second region;
a doped polycrystalline silicon layer on the insulating layer a portion of which acts as a gate;
a first conductive gate element on the polycrystalline silicon layer and positioned generally over the first region;
a second conductive gate element on the polycrystalline silicon layer and spaced from and generally surrounding the first conductive gate element;
a drain contact on the substrate and spaced apart from the insulating layer; and





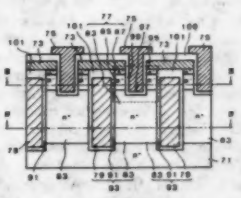
the portion of the polycrystalline silicon layer connecting the first and second conductive gate elements being a resistor element having a plurality of openings provided therethrough, the polycrystalline silicon layer thereby including a plurality of resistor regions, each of said resistor regions being connected to said first conductive gate element and said second conductive gate element, and whereby a resistance of said resistor element is a function of the sizes of said openings.

4,920,389

MEMORY CALL ARRAY STRUCTURE AND PROCESS FOR PRODUCING THE SAME

Masahiro Itoh, Minato, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Mar. 7, 1989, Ser. No. 320,232
Claims priority, application Japan, Mar. 8, 1988, 63-54487
Int. Cl.[5] H01L *29/78, 29/06, 27/02*
U.S. Cl. 357—23.6 **18 Claims**



1. A memory cell array comprising:
a semiconductor substrate of first conductivity type having a substrate surface including a plurality of first regions and a second region, the first regions being respectively surrounded by the second region;
a plurality of first semiconductor layers of a second conduc-

tivity type each isolatedly formed on the first regions of the substrate surface, each of said first semiconductor layers having first top, bottom and side surfaces;

a second semiconductor layer of the first conductivity type formed on the first top surface of each of said first semiconductor layers, said second semiconductor layer having second top, bottom and side surfaces, and further having a first interior surface defining a first hole extending from the second top surface to the second bottom surface thereof;

a first insulating layer covering said first interior surface;

a first electrode provided in the first hole of said second semiconductor layer so as to confront the first interior surface of said second semiconductor layer through said first insulating layer;

a third semiconductor layer of the second conductivity type formed on the top surface of said second semiconductor layer, said third semiconductor layer having a third side surface;

a second insulating layer covering the first, second and third side surfaces and the second region of the substrate surface; and

a second electrode disposed adjacent to each of said first semiconductor layers so as to confront the side surface of each of said first semiconductor layers through the second insulating layer.

4,920,390

SEMICONDUCTOR MEMORY DEVICE AND METHOD OF FABRICATING THE SAME

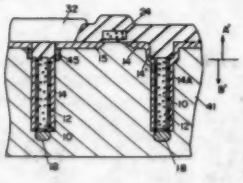
Genshu Fuse; Toshio Yamada, both of Hirakata; Shinji Odanaka, Sakai, and Masaki Fukumoto, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 877,968, Jun. 24, 1986, abandoned. This application Jul. 7, 1988, Ser. No. 218,456

Claims priority, application Japan, Jul. 2, 1985, 60-145568; Sep. 6, 1985, 60-198076

Int. Cl.[5] H01L *29/78*

U.S. Cl. 357—23.6 **13 Claims**



1. A semiconductor memory device comprising:

a semiconductor substrate having an upper surface and at least one groove therein, each said at least one groove extending around a part of said substrate and including a first groove portion proximate the upper surface of said substrate and a second groove portion extending from the bottom of said first groove portion to a location disposed within said substrate, the part of the substrate around which said at least one groove extends defining a respective island region, said island region including a first portion around which said first groove portion extends and a second portion around which said second groove portion extends;

a first electrode of a storage cell capacitor extending in each said second groove portion;

a dielectric layer of the storage cell capacitor disposed between said first electrode and the second portion of said island region;

a second electrode of the storage cell capacitor extending between and in contact with an outer circumferential side surface of the second portion of said island region and said dielectric layer;

an electrical insulating isolation layer disposed in and extending over the first groove portion of said at least one groove;

an MOS transistor having source, drain and channel regions and disposed at the first portion of said island region adjacent said electrical insulating isolation layer;

a connection region disposed alongside part of the first portion of said island region adjacent said dielectric layer, said connection region extending substantially vertically from said second electrode to one of said drain and said source regions of the MOS transistor for operatively conductively connecting said second electrode to said one of said source and said drain regions; and

a separation region disposed alongside another part of the first portion of said island region adjacent said dielectric layer, said separation region extending substantially vertically from said second electrode to the other of said drain and said source regions of the MOS transistor for operatively electrically insulating said second electrode from said other of said source and said drain regions.

4,920,391

SEMICONDUCTOR MEMORY DEVICE

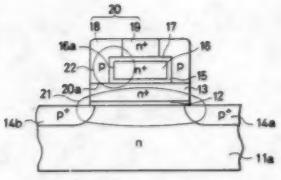
Hidetsugu Uchida, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Apr. 3, 1989, Ser. No. 332,584

Claims priority, application Japan, Apr. 5, 1988, 63-82311

Int. Cl.[5] H01L *29/78*

U.S. Cl. 357—23.6 **14 Claims**



1. A semiconductor memory device formed on a semiconductor substrate (11), comprising:

an active region (11*a*) forming part of a semiconductor substrate (11);

a gate insulating film (12) formed on the active region (11*a*);

a first polysilicon film (13) of a first conductivity type formed over said gate insulating film (12);

a second polysilicon film (16) formed over the first polysilicon film (13);

an insulating film (17) formed on the side of said second polysilicon film (16) and over said second polysilicon film (16); and

a third polysilicon film (20) formed on the side of said second polysilicon film (16) and over said second polysilicon film (16), being separated by the insulating film (17), and having a second conductivity type opposite to said first conductivity type, a contacting end (20*a*) of said third polysilicon film (20) being in contact with said first polysilicon film (13), part of said third polysilicon film formed over said second polysilicon film (16) having an impurity-doped region (19) of said first conductivity type;

said active region (11*a*), said gate insulating film (12) and said first polysilicon film (13) forming a first FET (21);

said first, second and third polysilicon films (13, 16, 20) forming a second FET (22), said second polysilicon film (16) forming a gate electrode; and

that part of said third polysilicon film (20) which is between said impurity-doped region (19) and said contacting end

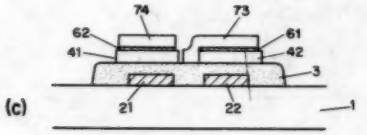
(20a) and adjacent to said second polysilicon film (16) forming a channel of said second FET (22).

4,920,392

COMPLEMENTARY FIELD EFFECT TRANSISTOR AND METHOD OF FORMING THE SAME

Masaharu Nishiura, Matsumoto, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Nov. 18, 1987, Ser. No. 122,114
Claims priority, application Japan, Nov. 20, 1986, 61-277434
Int. Cl.[5] H01L 29/72
U.S. Cl. 357—23.7 4 Claims



1. A complementary field effect transistor device comprising:

an insulating substrate having a gate electrode formed on a major surface thereof;

an insulating film covering said gate electrode and the area surrounding said gate electrode;

a substantially intrinsic semiconductor thin film covering said insulating film;

first and second islands of semiconductor thin film of one conductivity type formed over said intrinsic semiconductor thin film in a first paired relationship and positioned to both overlie a first region of said gate electrode, and first and second islands of semiconductor thin film of opposite conductivity type formed over said intrinsic semiconductor thin film in a second paired relationship and positioned to both overlie a second region of said gate electrode, one of the islands formed of said one conductivity type film being paired with one of the islands formed of said opposite conductivity film;

electrodes formed over the surface of each island formed of said opposite conductivity type semiconductor thin film opposite said gate electrode; and

electrodes formed over the surface of each island formed of said one conductivity type semiconductor thin film opposite said gate electrode on the same side of said intrinsic semiconductor thin film as the electrodes formed over the islands formed of said opposite conductivity type semiconductor thin film such that the electrode formed over said first island of said opposite conductivity type thin film and the electrode formed over said first island of said one conductivity type thin film are electrically connected with each other thereby to form a complementary fielded effect transistor.

4,920,393

INSULATED-GATE FIELD-EFFECT SEMICONDUCTOR DEVICE WITH DOPED REGIONS IN CHANNEL TO RAISE BREAKDOWN VOLTAGE

Masumi Kawakami, Miho, Japan, assignor to Texas Instruments Incorporated, Dallas, Tex.

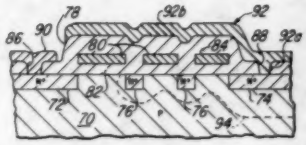
Continuation of Ser. No. 1,789, Jan. 8, 1987, abandoned. This application Feb. 13, 1989, Ser. No. 310,497
Int. Cl.[5] H01L 29/90, 29/78
U.S. Cl. 357—23.8 15 Claims

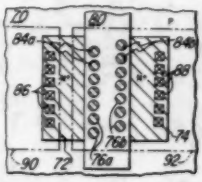
1. An insulated-gate field-effect semiconductor device comprising:

(a) a semiconductor layer of a first conductivity type, the semiconductor layer having a surface portion;

(b) heavily doped source and drain regions of a second conductivity type in said semiconductor layer, said source and drain regions being spaced apart from each other along the surface portion of said semiconductor layer;

(c) a plurality of heavily doped island regions of said second conductivity type in said semiconductor layer, the plurality of heavily doped island regions located between and spaced apart from said source and drain regions, said island regions occupying locations disposed transversely of the direction between said source and drain regions;





(d) an insulating layer on said surface portion;

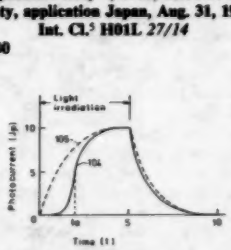
(e) a conductive layer overlaying said insulating layer and electrically isolated from said island regions, said conductive layer extending between said source and drain regions and said conductive layer having a plurality of closed boundary apertures aligned with individual ones of said island regions in said semiconductor layer.

4,920,394

PHOTO-SENSING DEVICE WITH S-SHAPED RESPONSE CURVE

Noboru Yukami; Mitsusuke Ikeda, both of Hirakata; Masaharu Ohno, Higashiosaka, and Mikihiko Nishitani, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kodama, Japan

Continuation of Ser. No. 768,842, Aug. 23, 1985, abandoned. This application May 4, 1988, Ser. No. 191,783
Claims priority, application Japan, Aug. 31, 1984, 59-181751
Int. Cl.[5] H01L 27/14
U.S. Cl. 357—30 6 Claims



1. A photo-sensing device for detecting light signals under application of a biasing light comprising:

a photo-electric transducing element of a material having a given response characteristic of photocurrent to time, namely a rise characteristic which is S-shaped;

said material of said photo-sensing device being a II–VI compound semiconductor made of a CdS-CdSe solid

solution including at least 40 mol percent CdSe and having a Cu material added thereto;

said Cu material constituting 0.01 mol % or more and 0.03 mol % or less of said material of said photo-sensing device;

said photocurrent being detected from said photo-sensing device irradiated by a main light which is adapted to be reflected onto a manuscript and to be further irradiated directly by a biasing light; and

the intensity of said biasing light being 1/100 to 1 of the intensity of said main light.

4,920,395

HIGH SENSITIVITY PHOTODIODE

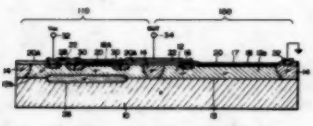
Hideo Muro, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Continuation of Ser. No. 925,219, Oct. 31, 1986, abandoned. This application Aug. 23, 1988, Ser. No. 235,803

Claims priority, application Japan, Nov. 8, 1985, 60-248795

Int. Cl.[5] H01L *27/14*

U.S. Cl. 357—30 **2 Claims**



1. A single-chip semiconductor photodetection device comprising:

a semiconductor substrate of first-type conductivity;

a semiconductor layer of opposite second-type conductivity formed on a principal surface of said substrate;

a photodiode part which comprises a first island region of said semiconductor layer surrounded by a first diffused region of the first-type conductivity formed through the entire thickness of said semiconductor layer, a second diffused region of the second-type conductivity formed for use as an electrode in a surface region of a selected area of said first island region and a shallow laminar region of the first-type conductivity formed in the surface of a major area of said first island region, wherein first and second active junctions are respectively formed at an interface of said first island region and said semiconductor substrate and an interface of said shallow laminar region and said first island region; and

a junction-gate field-effect transistor (JFET) part which comprises as a gate region a second island region of said semiconductor layer surrounded by the first diffused region, a diffused source region of the first-type conductivity formed in a surface region of said second island region, a diffused drain region of the first-type conductivity formed in a surface region of said second island region as a channel region a shallow laminar region of the first-type conductivity formed in the surface of said second island region in a location between said source region and said drain region and electrode means for interconnecting said source region with said gate region, the JFET part being electrically connected with said photodiode part such that in operation the JFET part provides a constant current to the photodiode part and compares the output current of the photodiode part with a predetermined current.

4,920,396

CMOS HAVING BURIED LAYER FOR CARRIER RECOMBINATION

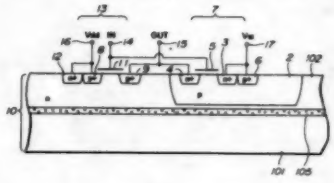
Toshiro Shinohara; Teruyoshi Mihara, and Kenji Yao, all of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 8, 1988, Ser. No. 179,315

Claims priority, application Japan, Apr. 13, 1987, 62-88912

Int. Cl.[5] H01L *27/02, 29/167, 29/161*

U.S. Cl. 357—42 **10 Claims**



1. A CMOS device comprising:

a first substrate region of a first conductivity type located in a semiconductor body which includes upper and lower single crystals, said first substrate region including an upper portion in said upper single crystal and a lower portion in said lower single crystal,

a second substrate region of a second conductivity type, opposite of said first conductivity type, located in said semiconductor body so as to form a pn junction with said first substrate region,

a first conductivity type channel MOSFET in said second substrate region, and a second conductivity type channel MOSFET in said first substrate region, and

a recombination layer in said first substrate region facilitating recombination of minority carriers, said recombination layer being separate from said pn junction, said recombination layer being between said upper and lower portions of said first substrate region.

4,920,397

STRUCTURE OF COMPLEMENTARY FIELD EFFECT TRANSISTOR

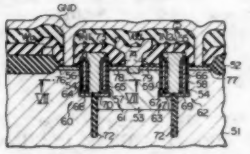
Toshiyuki Ishijima, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 25, 1988, Ser. No. 173,478

Claims priority, application Japan, Mar. 26, 1987, 62-73241

Int. Cl.[5] H01L *27/02*

U.S. Cl. 357—42 **11 Claims**



1. A complementary field effect transistor fabricated in a semiconductor substrate of a first conductivity type, comprising:

(a) a well formed in a surface portion of said semiconductor substrate and having a second conductivity type opposite to said first conductivity type, a groove being defined by a first side wall of the surface portion of said semiconductor substrate, a first bottom wall of the surface portion, a second side wall of said well and a second bottom wall of the well, said groove having a rectangular cross section;

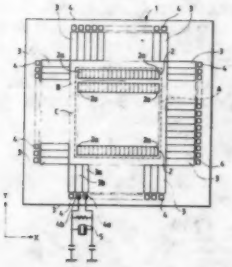
(b) a first drain region of said second conductivity type formed in said semiconductor substrate and exposed to said first bottom wall;
(c) a first source region of said second conductivity type formed in said surface portion and spaced apart from said first drain region;
(d) a first gate insulating film formed on said first side wall;
(e) a first gate electrode formed on said first gate insulating film and operative to cause a channel to take place between said first drain region and said first source region, said first drain region, said first source region, said first gate insulating film and said first gate electrode forming in combination a first MIS type field effect transistor;
(f) a second drain region of said first conductivity type formed in said well and exposed to said second bottom wall;
(g) a second source region of said first conductivity type formed in a surface portion of said well and spaced apart from said first drain region;
(h) a second gate insulating film formed on said second side wall;
(i) a second gate electrode formed on said second gate insulating film and operative to cause a channel to take place between said second drain region and said second source region, said first and second gate electrodes being formed in a ring shaped conductive material, and said second drain region, said second source region, said second gate insulating film and second gate electrode forming in combination a second MIS type field effect transistor;
(j) a conductive material provided in said groove and contacting with said first and second drain regions for electrically interconnecting said first drain region and said second drain region, thereby forming said complementary field effect transistor; and
(k) an insulating wall region formed between said first drain region and said second drain region and having a rectangular cross section.

4,920,398

SEMICONDUCTOR MIS INTEGRATED CIRCUIT DEVICE

Shintani Yoshio, Kokubungi, and Inatsu Mikio, Mitaka, both of Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Engineering Ltd., both of Tokyo, Japan

Filed Jun. 9, 1989, Ser. No. 363,835
Claims priority, application Japan, Jun. 29, 1988, 63-162156
Int. Cl.[5] H01L *27/02*
U.S. Cl. 357—42 **8 Claims**



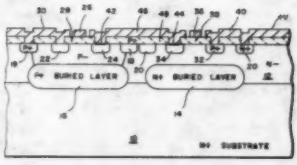
1. A semiconductor integrated circuit device comprising:
a semiconductor pellet;
a rectangular internal cell array consisting of a plurality of basic cell lines each being formed by arranging a plurality of basic cells formed on said semiconductor pellet and juxtaposed in the same direction;
a plurality of basic cells for input/output buffer circuits disposed in the outer peripheral direction of said internal cell array and including MISFETs for output circuit for forming an output circuit and MISFETs for input circuit for forming an input circuit;
external terminals disposed in such a manner as to correspond to said basic cells for the input/output buffer circuits and to be positioned more outward than said basic cells for the input/output buffer circuits;
an oscillator disposed outside said semiconductor pellet; and
an oscillation circuit consisting of said oscillator and said MISFETs for said output circuit, with said MISFETs for said output circuit forming an amplification circuit portion of said oscillation circuit.

4,920,399

CONDUCTANCE-MODULATED INTEGRATED TRANSISTOR STRUCTURE

John H. Hall, San Jose, Calif., assignor to Linear Integrated Systems, Inc., Fremont, Calif.

Continuation of Ser. No. 243,428, Sep. 12, 1988, abandoned. This application Oct. 10, 1989, Ser. No. 418,962
Int. Cl.[5] H01L *27/02*
U.S. Cl. 357—42 **6 Claims**

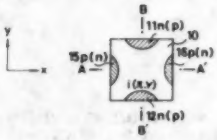


1. An integrated CMOS transistor structure comprising a semiconductor body having a major surface with a first device region of a first conductivity type and a second device region of a second conductivity type therein,
a first device formed in said first device region and including a source region and a drain region of said second conductivity type, said source and drain regions being spaced apart by a channel region and each of said source and drain regions forming a p-n junction with said first device region, a gate contact between said source and drain regions and insulatively spaced from said device region, an ohmic contact solely to said source region and a Schottky contact solely to said drain region, said Schottky contact forming a Schottky diode with said drain region which is forward biased and injecting minority carriers into said channel region when said gate contact is voltage biased on.
a second device formed in said second device region and including a source region and a drain region of first conductivity type, said source and drain regions being spaced apart by a channel region and each of said source and said drain regions forming a p-n junction with said second device region, a gate contact between said source and drain regions and insulatively spaced from said second device region, an ohmic contact solely to said source region and a Schottky contact solely to said drain region, said Schottky contact forming a Schottky diode with said drain region which is forward biased and injecting minority carriers into said channel region when said gate contact is voltage biased on.
input connector means interconnecting said gate contacts of said first and second devices, and
output connector means interconnecting said Schottky contacts of said first and second devices.

4,920,400
SEMICONDUCTOR DEVICE

István Bársony, Budapest, Hungary, assignor to Research Development Corporation of Japan, Tokyo, Japan and Barsony Istvan, Istenhegyi, Hungary

Continuation of Ser. No. 925,368, Oct. 30, 1986, abandoned. This application Jan. 18, 1989, Ser. No. 298,841
Claims priority, application Japan, Nov. 1, 1985, 60-244091
Int. Cl.[5] H01L *29/12, 29/00, 27/02*
U.S. Cl. 357—58 **5 Claims**



1. A semiconductor device having a main body region of a substantially intrinsic semiconductor two pairs of terminals defined by electrode regions, one of said pairs being of a p-type conductivity and the other pair being of an n-type, the built-in potentials of said terminals inducing a single potential barrier in said main body, whereby two controlled current paths are formed, each passing through said potential barrier and between a different one of said pairs of terminals, so that said two current paths comprise one electron path for allowing flow of a majority current formed of electrons and one hole path for allowing flow of a majority current formed of holes, the two paths being non-interacting, each current path having a current flow defined by a predetermined transfer function representing the relationship between current in the respective path and the height of said single potential barrier structure, said device being constructed so that said potential barrier height is controlled by input voltages applied to said pairs of terminals of the device.

4,920,401
BIPOLAR TRANSISTORS

Tetsushi Sakai, Sayama; Yoshizi Kobayasi; Hironori Yamauchi, both of Tokyo, and Yoshinobu Arita, Hoya, all of Japan, assignors to Nippon Telegraph & Telephone Public Corp., Japan

Continuation of Ser. No. 524,470, Aug. 19, 1983, abandoned, which is a continuation of Ser. No. 158,784, Jun. 12, 1980, abandoned, which is a continuation of Ser. No. 898,074, Apr. 20, 1978, abandoned. This application Mar. 14, 1985, Ser. No. 710,950
Claims priority, application Japan, Apr. 25, 1977, 52-46737
Int. Cl.[5] H01L *29/72, 29/34, 29/04, 23/48*
U.S. Cl. 357—59 **6 Claims**

1. A planar type bipolar transistor with a vertical transistor structure comprising:

a collector region of a first conductivity type;

an insulating layer formed on said collector region and defining an opening to said collector region;

a base region formed in said collector region at said opening and having an impurity of a second conductivity type opposite said first conductivity type, said base region having a periphery;

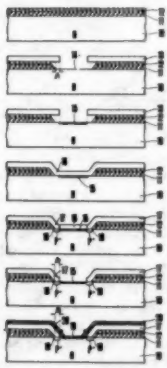
a base contact region provided at and contacting the entire periphery of said base region, said base contact region containing an impurity of said second conductivity type in higher concentration than the concentration of impurity in said base region;

an emitter region of said first conductivity type disposed as an island in said base region and having an outer peripheral edge portion abutting said base region at an emitter-base junction having a top planar side and circumscribing said emitter region;

a base electrode of polycrystalline silicon containing an impurity of said second conductivity type formed in contact with said base contact region and extending onto said insulating layer, said base electrode having an inner peripheral edge portion spaced from and circumscribing said emitter region;

an emitter electrode in contact with said emitter region and having an outer peripheral edge portion; and

an insulating film covering and contacting at least the inner peripheral edge portion of said base electrode and extending outwardly therefrom onto said base electrode, said insulating film circumscribing and contacting the entire outer peripheral edge portion of said emitter electrode and covering and contacting the top planar side of the emitter-base junction for electrically isolating said base electrode from said emitter electrode;

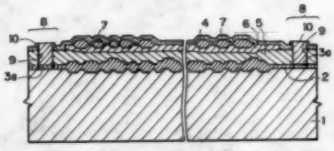


wherein said base electrode contacts said base contact region along a band of constant width, said band having an inner circumference circumscribing said emitter region and spaced from the outer peripheral edge of said emitter region by a constant distance everywhere along the length of the band.

4,920,402
INTEGRATED CIRCUIT DEVICE

Masao Nakaya, [illegible] Yasutaka Horiba, both of Itami, all of Japan, assignors [illegible] Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 3, 1988, Ser. No. 251,768
Claims priority, application Japan, Feb. 15, 1988, 63-33221
Int. Cl.[5] H01L *27/02*
U.S. Cl. 357—68 **6 Claims**



1. An integrated circuit device having multilayer structure, comprising:

a substrate;

an integrated circuit formed on one major surface of said substrate;

an insulating layer formed on said integrated circuit;

dummy elements provided on a prescribed region of said insulating layer and formed by the same material as that for said integrated circuit;

a protective film formed on said insulating layer to cover said dummy elements;

bonding holes formed in the upper surface of said protective film to reach upper surface parts of said integrated circuit through said insulation layer while avoiding said region provided with said dummy elements; and

bonding pads formed in said bonding holes to have upper ends exposed from the upper surface of said protective film and lower ends electrically connected to said integrated circuit.

4,920,403

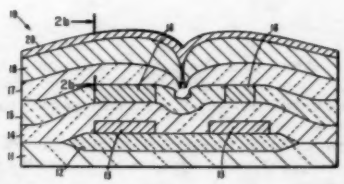
SELECTIVE TUNGSTEN INTERCONNECTION FOR YIELD ENHANCEMENT

Yu C. Chow; Kuan Y. Liao, both of Irvine; Maw-Rong Chin, and Charles S. Rhoades, both of Huntington Beach, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 17, 1989, Ser. No. 338,682

Int. Cl.[5] H01L *23/48*; B44C *1/22*; C23F *1/02*

U.S. Cl. 357—71 **16 Claims**



10. In an integrated circuit having at least two layers of metal interconnection lines separated by an oxide layer and comprising:

a layer of metal interconnection formed lines over an oxide layer; and

a tungsten layer selectively deposited onto the layer of metal interconnection lines to form fully interconnected metal lines.

4,920,404

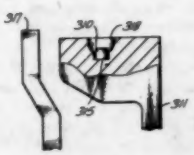
LOW STRESS LIGHT-EMITTING DIODE MOUNTING PACKAGE

Dinesh C. Shrimali, San Ramon; Frank M. Steranka, San Jose, and Cheryl L. McLeod, Mountain View, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 12, 1989, Ser. No. 351,194

Int. Cl.[5] H01L *23/28, 33/00*

U.S. Cl. 357—72 **30 Claims**



1. A light-emitting diode package comprising:

a metal lead;

a cavity having walls, a bottom and an open end in the metal lead;

a light-emitting diode having sides and a front face in the bottom of the cavity in electrical contact with the metal lead; and

a rigid plastic potting material between the light-emitting diode and the walls of the cavity, and

means for minimizing light degradation of the light-emitting diode comprising a sufficiently small clearance between the sides of the light-emitting diode and the walls of the cavity that the amount of plastic potting material between the sides of the light-emitting diode and the walls is insufficient for applying light degrading stresses on the light-emitting diode due to differential thermal expansion.

4,920,405

OVERCURRENT LIMITING SEMICONDUCTOR DEVICE

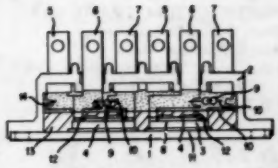
Shinichi Itoh, and Hisao Shigekane, Kawasaki, both of Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Nov. 25, 1987, Ser. No. 125,688

Claims priority, application Japan, Nov. 28, 1986, 61-283533; Feb. 5, 1987, 62-25059

Int. Cl.[5] H01L *23/02, 23/12, 23/16, 23/28*

U.S. Cl. 357—74 **11 Claims**



1. An overcurrent limiting semiconductor device comprising:

a package formed with a base plate, sidewalls and a cover plate;

at least one transistor fixed onto said base plate;

an encapsulation layer comprising a first resin layer formed on said base plate and a second resin layer formed on said first resin layer, said first resin layer and said second resin layer being made of different materials;

terminal conductors respectively connected to the base, emitter and collector electrodes of said transistor, and being led out through the cover plate; and,

a plurality of diodes electrically connected in series across base and emitter terminal conductors of said transistor, said being located in a space provided between said cover plate and said base plate of said package and being connected to the base and emitter terminal conductor of said transistor, said diodes comprising overcurrent limiting diodes enclosed in said second resin layer.

4,920,406

SEMICONDUCTOR DEVICE

Yoshio Watanabe, Kawasaki, and Shinji Emori, Urawa, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

PCT No. PCT/JP87/00079, § 371 Date Oct. 7, 1987, § 102(e) Date Oct. 7, 1987, PCT Pub. No. WO87/04855, PCT Pub. Date Aug. 13, 1987

PCT Filed Feb. 6, 1987, Ser. No. 124,944

Claims priority, application Japan, Feb. 7, 1986, 61-024181

Int. Cl.[5] H01C *23/02, 23/12*

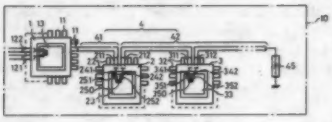
U.S. Cl. 357—74 **18 Claims**

1. A semiconductor devices operatively connectable to a drive side transmission line and a to a terminating side transmission line, comprising:

a pair of package leads each with an external end and an

internal end, the external end of one of said package leads being electrically connectable to the drive side transmission line and the external end of another one of said package leads being electrically connectable to the terminating side transmission line;

an integrated circuit chip having pads, the internal ends being electrically connected to said integrated circuit chip through at least one of said pads; and



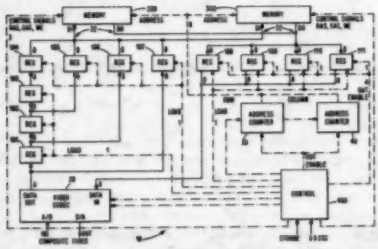
a pair of conductors each having first and second ends, the first ends are respectively connected to said pair of package leads and the second ends are connected to at least one of said pads, the internal ends are electrically connected together via said pair of conductors and at least one of said pads.

4,920,407

COMPOSITE VIDEO FRAME STORE

James C. Stoddard, Wayland, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jan. 3, 1989, Ser. No. 292,784
Int. Cl.[5] H04N *9/64, 5/91*
U.S. Cl. 358—21 R **3 Claims**



1. Apparatus for storing a composite video frame including synchronization signals, color burst signals, and analog signals comprising:

sampling means providing digitized samples of the synchronization signals, color burst signals and analog signals of a video frame;

a first memory addressed by rows and columns;

a second memory addressed by rows and columns;

an input register coupled to said first and second memories for buffering a plurality of digitized samples; an output register coupled to said first and second memories

for buffering the outputs of said memories; addressing means for providing sequential addresses to said

first and second memories for each cycle; control means for providing, during a write cycle, control

signals for enabling said input register to buffer said samples and alternately write enabling said first memory and said second memory to store said samples, and, for providing during a read cycle, control signals for

alternately read enabling said first memory and said

second memory to output said samples and to enable said

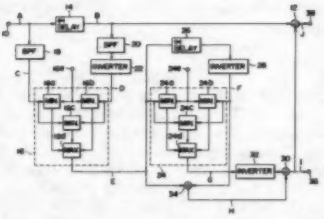
output register to buffer said output; and means for converting said output into analog.

4,920,408

CIRCUIT FOR SEPARATING COMPOSITE COLOR TELEVISION SIGNAL INTO LUMINANCE SIGNAL AND CHROMINANCE SIGNAL

Toshimitu Umezawa, Kazo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 24, 1989, Ser. No. 314,773
Claims priority, application Japan, Mar. 2, 1988, 63-48893
Int. Cl.[5] H04N *9/78*
U.S. Cl. 358—31 **16 Claims**



1. A circuit for separating a luminance signal and a chrominance signal from a composite color television signal supplied to an input terminal and outputting the luminance and chrominance signals, comprising:

first delay means for delaying the composite color television signal supplied to said input terminal by one horizontal line period;

first extracting means for extracting frequency components in the vicinity of a color subcarrier frequency from the composite color television signal supplied to said input terminal;

second extracting means for extracting frequency components in the vicinity of the color subcarrier frequency from an output signal of said first delay means;

first waveform selecting mean connected to receive a first signal obtained by inverting one of the output signals of said first and second extracting means and a second signal corresponding to another output signal of said first and second extracting means, for extracting only those components of the first and second signals which have the same waveform at the same time;

second delay means for delaying an output signal of said first waveform selecting means by one horizontal line time;

second waveform selecting means connected to receive a third signal obtained by inverting one of the output signals of said first waveform selecting means and said second delay means and a fourth signal corresponding to another output signal of said first waveform selecting means and said second delay means, for extracting only those components of the third and fourth signals which have the same waveform at the same time;

adder means for adding the third and fourth signals;

first signal synthesizing means for performing subtraction between the output signal of said second waveform selecting means and the output signal of said adder means to provide the chrominance signal; and

second signal synthesizing means for adding the output signal of said first signal synthesizing means and the output signal of said first delay means to provide the luminance signal.

4,920,409

MATRIX TYPE COLOR LIQUID CRYSTAL DISPLAY DEVICE

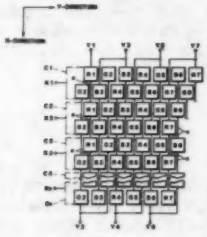
Kooji Yamagishi, Oome, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Jun. 20, 1988, Ser. No. 209,422

Claims priority, application Japan, Jun. 23, 1987, 62-96233[U]; Jun. 23, 1987, 62-96234[U]; Jul. 29, 1987, 62-115048[U]; Jul. 29, 1987, 62-115049[U]; Jul. 29, 1987, 62-115050[U]

Int. Cl.[5] H04N 9/30

U.S. Cl. 358—56 25 Claims



1. A matrix type color liquid crystal display device, comprising:

a plurality of stripe-shaped common electrodes having a long edge extending along a horizontal direction, and also a short edge extending along a vertical direction perpendicular to the horizontal direction;

a plurality of substantially square-shaped segment electrodes for displaying at least three different color pixels, positioned opposite to said plurality of stripe-shaped common electrodes so as to form a matrix pattern, a width of each of said segments electrodes along the vertical direction being equal to approximately only one half that of said short edge of each of said common electrodes, and said segment electrodes being aligned along first and second lines, which are positioned parallel to each other along the horizontal direction, with respect to each of said common electrodes under the condition that said segment electrodes arranged in said first line are positionally shifted by a predetermined positional shift amount with respect to said segment electrodes arranged in said second line, and also said segment electrodes for displaying same color pixels are alinged along the vertical direction;

signal lines connected to said segment electrodes for selectively displaying the same color pixels along the vertical direction through said segment electrodes, for displaying the different color pixels and supplying drive signals thereto, thereby forming segment electrode columns for the same color pixels and different color pixels; and

connection lines for connecting said segment electrode columns that display the same color pixels and which columns are positioned adjacent to each other in the vertical direction, so as to form individual pairs of adjoining same color segment electrode columns that sandwich segment electrode columns which display pixels of a different color among said segment electrode columns connected by said signal lines, said individual pairs of adjoining same color segment electrode columns arranged to be simultaneously energized via said connection lines and said signal lines.

4,920,410

DRIVE METHOD FOR SYNCHRONIZING SCANNING AND MODULATION OF FLAT-CONFIGURATION COLOR CRT

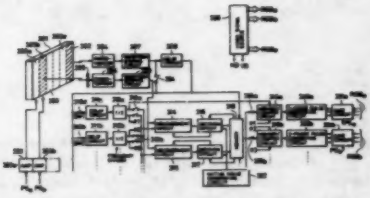
Kaoru Tomii, Isehara; Hiroshi Miyama, Yokohama; Yoshikazu Kawauchi, Kawasaki, and Jun Nishida, Tokyo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 25, 1988, Ser. No. 185,628

Claims priority, application Japan, Apr. 24, 1987, 62-102255; Apr. 27, 1987, 62-103501; Aug. 6, 1987, 62-196716

Int. Cl.[5] G09G 1/00

U.S. Cl. 358—67 12 Claims



1. A method of controlling, in synchronism with electron beam scanning of successive fluorescent element color trios of a color cathode ray tube, timings of primary color components of a point-sequential video signal for driving a modulation electrode of the cathode ray tube, the method comprising:

(a) deriving an index signal comprising, during each of successive horizontal scanning intervals of said electron beam scanning, a pulse train having a frequency identical to a trio frequency of said electron beam scanning;

(b) deriving a scanning timing signal comprising, during each of said horizontal scanning intervals, a train of pulses respectively generated at timings coinciding with timings of electron beam scanning of a predetermined fluorescent element in corresponding ones of said color trios;

(c) frequency dividing said index signal to obtain n-phase index signals comprising, during each of said horizontal scanning intervals, n pulse trains mutually differing in phase by 360/n degrees, where n is an integer of value greater than one;

(d) measuring time differences between each of $(1+m\cdot n)^{th}$ pulses of said scanning timing signal and a pulse of a first one of said n-phase index signals, time differences between each of $(2+m\cdot n)^{th}$ pulses of said scanning timing signal and a pulse of a second one of said n-phase index signals, . . . and between each of $(n+m\cdot n)^{th}$ pulses of said scanning timing signal and a pulse of an n^{th} one of said n-phase index signals, where m takes the values 0, 1, 2, . . . ;

(e) storing said time differences as respective data values in memory means; and,

(f) subsequently reading out said time difference values sequentially from said memory means and producing successive pulses at respective timings relative to said n-phase index signals that are determined by said time difference values, to thereby regenerate said scanning timing signal, and applying said scanning timing signal to control said primary color component timings of said video signal.

4,920,411

METHOD FOR PROCESSING IMAGE SIGNALS SO AS TO COLOR CORRECT THEM

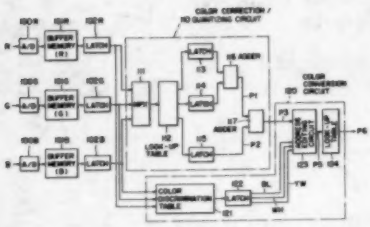
Tadashi Miyakawa, Kaisei, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 3, 1988, Ser. No. 229,729

Claims priority, application Japan, Apr. 11, 1984, 59-71000; Apr. 12, 1984, 59-73590; May 1, 1984, 59-88059

Int. Cl.[5] G03F 3/08; H04N 1/46

U.S. Cl. 358—80 **6 Claims**



1. An image signal processing method for a picture output device, said processing method of the type which converts three color separation signals of an original into digital signals, color corrects the digital signals and records a color image in accordance with the color corrected signals, said method comprising the steps of:

storing in a memory as a data table multiplied results of said three color separation signals and corresponding predetermined color correction coefficients;

sequentially reading out respective multiplied results from said memory in accordance with the value of each of the digital signals converted from said three color separation signals;

adding said sequentially read out multiplied results; and

outputting color corrected signals according to said added multiplied results for recording of said color image;

wherein a predetermined operating time for generating each of said color corrected signals for each pixel of said color image during said recording of said color image is divided into N operating times;

wherein a different one of the digital signals is inputted into the memory in a predetermined order during each of said N operating times;

wherein said adding step is conducted during each of the 2nd through Nth operating times using a temporary memory means, and

wherein N is an integer greater than 1.

2. An image signal processing method for a picture output device, said processing method of the type which converts three color separation signals RGB of an original into digital signals, color corrects the digital signals and records a color image using the color corrected signals, said method comprising the steps of:

storing data as a color conversion table for outputting specific color signals in correspondence with respective specific color distributions of said three color separation signals RGB;

discriminating the color distribution of said three color separation signals RGB by inputting the digital signals converted from the three color separation signals RGB to a color discriminating table, wherein said color discriminating table outputs a specific color discriminating signal when the color separation signals have a respective specific color distribution;

inputting as an address signal said output specific color discriminating signal into said color conversion table via an address editing circuit; and

outputting from said color conversion table the specific color signal corresponding to the output specific color discriminating signal.

4. An image signal processing method for a picture output device, said processing method of the type which converts three color separation signals RGB of an original into digital signals, color corrects the digital signals and records a color image using the color corrected signals, said method comprising the steps of:

setting a number of output colors of said color image;

setting a number of quantization levels for digitizing said three color separation signals RGB in accordance with said set number of output colors;

processing the digital signals converted from the three color separation signals RGB to have the set number of quantization levels;

color correcting the processed digital signals; and

outputting analog signals in accordance with said color corrected signals to record a color image having said set number of output colors.

4,920,412

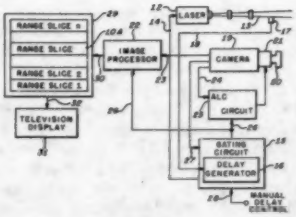
ATMOSPHERIC OBSCURANT PENETRATING TARGET OBSERVATION SYSTEM WITH RANGE GATING

David W. Gerdt, and Lawrence H. Gilligan, both of Charlottesville, Va., assignors to Sperry Marine Inc., Charlottesville, Va.

Filed Dec. 22, 1988, Ser. No. 288,549

Int. Cl.[5] H04N 7/18, 7/00

U.S. Cl. 358—95 **13 Claims**



1. Apparatus for use in a target observation system for clearing obscurants from a scene to be observed, said system including a source of pulses of illuminant energy for illuminating said scene, comprising

gated receiver means for receiving illuminant energy from said pulses reflected back from said scene, and providing an image in accordance therewith,

gating means for providing a gating pulse to said gated receiver means to receive said illuminant energy over the width of said gating pulse,

delay means for delaying said gating pulse in accordance with the travel time required for a pulse of illuminant energy to travel from said source to a range slice of said scene and back to said gated receiver means so that said gated receiver means is disabled during said travel time from receiving said reflected illuminated energy,

thereby providing an image of range slice cleared of said obscurants,

adjustment means for adjusting said delay means in accordance with successive range slices of said scene, and

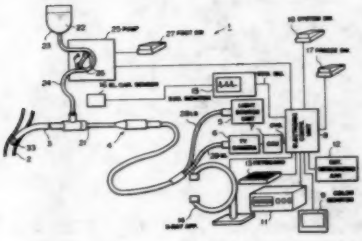
isolating and assembling means cooperative with said adjustment means for isolating images of said successive range slices and assembling said images into an image of said scene cleared of said scene obscurants.

4,920,413

BLOOD-VESSEL ENDOSCOPE SYSTEM FOR STORING A FROZEN PICTURE IN SYNCHRONIZATION WITH HEART PULSATION

Ichiro Nakamura, Kokubunji; Naruto Shinkai, Tokyo, both of Japan; David Barlow, Hicksville, and Akio Nakada, Lake Success, both of N.Y., assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 28, 1989, Ser. No. 317,247
Int. Cl.[5] A61B 1/06; H04N 7/18
U.S. Cl. 358—98 13 Claims



1. A blood-vessel endoscope system comprising:

(a) an electronic endoscope including

an inserting section inserted into a blood vessel in a living body,

a light guide means, inserted through said inserting section, for transferring illumination light from a trailing end to a leading end and for emitting said illumination light from said leading end,

an objective optical system disposed at the leading end of said inserting section focusing an object illuminated by said illumination light emitted from said leading end of said light guide means, and

an imaging device photoelectrically converting an optical image obtained by said objective optical system;

(b) light source means for supplying said illumination light to the trailing end of said light guide means;

(c) a drive circuit outputting a drive signal to read a photoelectrically converted image signal from said imaging device;

(d) a signal processing circuit for generating a standard video signal by signal processing said image signal read from said imaging device by applying said drive signal;

(e) a color monitor displaying a picture from said video signal;

(f) a heart pulsation measuring means for measuring heart pulsation of said living body;

(g) frozen-picture memorizing means for storing, as a frozen picture, an endoscopic image obtained by imaging in said imaging device; and

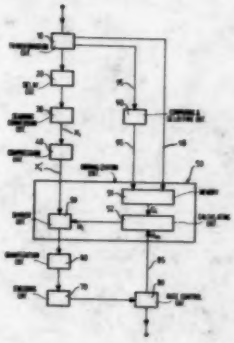
(h) frozen-picture release controlling means for generating, from a signal waveform output from said heart pulsation measuring means, a plurality of timing signals, during one cycle of heart pulsation, synchronized with said signal waveform and for then supplying said timing signals to a frozen-picture memorization controlling terminal of said frozen-picture memorizing means.

4,920,414

DIGITAL VIDEO SIGNAL ENCODING ARRANGEMENT, AND CORRESPONDING DECODING ARRANGEMENT

Christian Remus, Joinville-le-Pont, and Olivier Chanteloup, Paris, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 27, 1988, Ser. No. 250,019
Claims priority, application France, Sep. 29, 1987, 87 13429
Int. Cl.[5] H04N 7/12, 11/06
U.S. Cl. 358—133 6 Claims



1. A digital video signal encoding arrangement, comprising a correlation reducing circuit (10) receiving said digital signals which are representative of the luminance or the chrominance of a certain number of elements of a picture which has been divided into blocks, a scanning conversion circuit (30) transforming the bidimensional sequence of the values of the output coefficients $F_i(u,v)$ of the correlation reducing circuit (10) into a monodimensional sequence, a normalization circuit (50), a quantizing circuit (60) which converts each normalized output value of the normalization circuit into an integral value, a circuit (70) for encoding said quantized values, a rate controlling circuit (80) receiving in accordance with the variable rate said encoded values and, on the one hand, returns to the normalization circuit (50) a mean standard value N_m which is linked to said rate and, on the other hand, supplies encoded values at a constant rate from the output of the encoding arrangement, characterized in that the normalization circuit itself comprises:

(a) a memory (51) for storing the weighting coefficients, which on the one hand is addressed by the index i indicating the position of each value $F_i(u,v)$ of the current block, available at a first input line (15) of the normalization circuit (50) and on the other hand by a value which is representative of the activity of the current block, available at a second input line (95);

(b) a circuit (52) for calculating the standard K_i on the basis of, on the one hand, said mean standard value N_m supplied by the rate controlling circuit and, on the other hand, of the weighting coefficient supplied by said storage memory of the normalization circuit;

(c) a circuit (59) for dividing the output of the scanning conversion circuit by the coefficient K_i corresponding to the output of said standard calculating circuit.

4,920,415

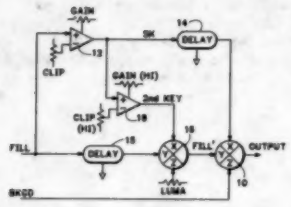
SELF KEYER

Daniel J. Chaplin, Nevada City, Calif., assignor to The Grass Valley Group, Inc., Nevada City, Calif.

Filed Mar. 20, 1989, Ser. No. 325,844
Int. Cl.[5] H04N 5/272
U.S. Cl. 358—183 11 Claims

1. An improved self keyer of the type having means for

deriving a self key signal from a fill video and means for mixing the fill video with a background video under control of the self key signal to produce an output video, the improvement com-



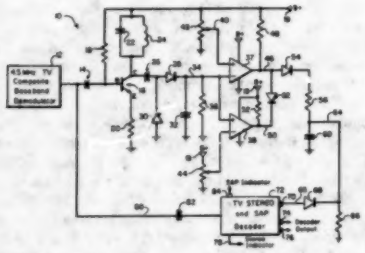
prising means for preconditioning the fill video prior to input to the mixing means by replacing low luminance portions of the fill video with a variable transition signal.

4,920,416

METHOD AND APPARATUS FOR DETECTING A DESIRED TELEVISION SIGNAL

Tsutomu Motoyama, Knoxville, Tenn., assignor to North American Philips Corp., New York, N.Y.

Filed Mar. 17, 1988, Ser. No. 169,793
Int. Cl.[5] H04N *5/60, 1/16*
U.S. Cl. 358—198 **17 Claims**



1. In a television receiver for receiving a multichannel television sound signal, a signal detector for detecting the presence of a desired signal in a composite baseband input signal including said multichannel television sound signal in the BTSC format, said desired signal having a predetermined frequency and amplitude in a background of other signals, noise, and harmonics, said signal detector comprising:

first means for receiving the composite baseband input signal, for detecting the desired signal having the predetermined frequency in the composite baseband input signal, and for producing a signal corresponding to the amplitude of the signals having the predetermined frequency; and

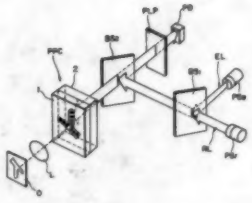
second means for receiving the corresponding signal, for comparing the corresponding signal to a predetermined amplitude range that is defined by and between first and second thresholds and that corresponds to an acceptable amplitude range for the desired signal, for detecting when the amplitude of the corresponding signal is below the first threshold, for detecting when the amplitude of the corresponding signal is above the second threshold, and for producing a detect signal only when said corresponding signal is within said predetermined amplitude range between the first and second thresholds, whereby said detect signal is produced only when said composite baseband input signal includes signals within the acceptable amplitude range having the predetermined frequency.

4,920,417

PHOTO-TO-PHOTO CONVERSION ELEMENT AND ITS APPLIED SYSTEM

Itsuo Takanashi, Kamakura; Shintaro Nakagaki, Fujisawa; Hirohiko Shinonaga, Yokohama; Tsutou Asakura, Yokohama, and Masato Furuya, Yokosuka, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Continuation-in-part of Ser. No. 139,005, Dec. 29, 1987, Pat. No. 4,831,452. This application Feb. 21, 1989, Ser. No. 313,073
Claims priority, application Japan, Feb. 21, 1988, 63-37800
Int. Cl.[5] H04N *5/30*
U.S. Cl. 358—209 **5 Claims**



1. A photo-to-photo conversion element comprising, in an arranged sequence in line;

a first optical member having a wavelength selectivity passing a write light having a first wavelength range, and blocking an erase light;

a first transparent electrode;

a photoconductive layer;

a second optical member having a wavelength selectivity reflecting a read light having a second wavelength range and passing said erase light;

a third optical member for electrooptically modulating a light incident thereto through the second optical member in response to the strength distribution of n electric field applied thereto; and

a second transparent electrode

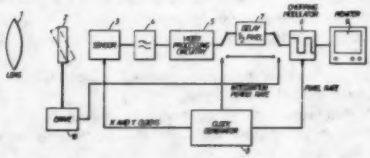
said erase light having a wavelength outside of both said first and second wavelength ranges.

4,920,418

IMAGING SYSTEM HAVING A SWING-DRIVEN IMAGE SENSOR

Christopher P. Robinson, Shepton Mallet, United Kingdom, assignor to GEC-Marconi Limited, Stanmore, United Kingdom

Filed Apr. 26, 1988, Ser. No. 186,268
Claims priority, application United Kingdom, Apr. 27, 1987, 8709916
Int. Cl.[5] H04N *3/14*
U.S. Cl. 358—213.28 **11 Claims**



1. An imaging system comprising:

an array of solid state imaging elements for producing an image signal corresponding to an optical input to said imaging elements;

means for optically shifting said optical input out of spacial coincidence, in synchronism with a pixel rate so that the

image signal produced by said array is out of spacial coincidence;

primary sampling means for sequentially sampling the out of coincidence image signal from said imaging elements at a pixel rate to produce an out of spacial coincidence field signal;

means for processing the out of coincidence field signal to produce a video signal for display of said field signal in spatial coincidence, representative of the optical input;

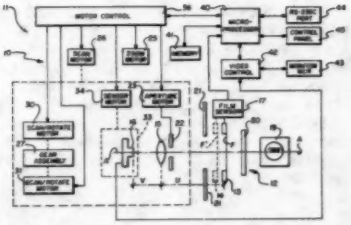
and secondary sampling means for sampling the video signal at a rate synchronous to said pixel rate, including a chopping modulator for generating a square waveform synchronous to said pixel rate wherein said video signal is sampled by said secondary sampling means during every other half cycle of said waveform.

4,920,419

ZOOM LENS FOCUS CONTROL DEVICE FOR FILM VIDEO PLAYER

Robert W. Easterly, Churchville, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 31, 1988, Ser. No. 200,327
Int. Cl.[5] G02B *7/11*
U.S. Cl. 358—214 **13 Claims**



1. A device to control the focus in a film video player for projection of at least a portion of a film image carried by a film image mount onto a sensor which generates a corresponding video signal from a sensor image, the film video player having a fixed focal length lens located on an optical axis between said film image mount and said sensor to project said portion onto said sensor, said device comprising: means for moving said lens axially of said film image mount for selectively changing the magnification of the sensor image with respect to the film image; means for moving said sensor axially of said film image mount mechanically independently of movement of said lens by said lens moving means for adjusting the focus of the sensor image; and, means for determining the necessary adjustment and for controlling said means for adjusting to maintain the focus of the sensor image for changes in the selected magnification.

4,920,420

AUTOMATIC FOCUSING SYSTEM

Kenji Sano; Takesuke Maruyama; Hironobu Satoh; Masaharu Deguchi, and Toshio Murakami, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 10, 1988, Ser. No. 269,699
Int. Cl.[5] H04N *5/232*
U.S. Cl. 358—227 **5 Claims**

1. An automatic focusing system comprising:

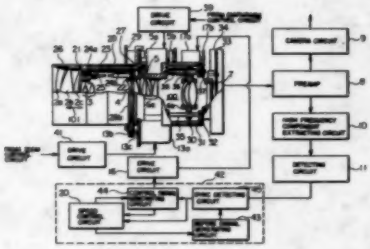
an image pickup device;

image forming means which includes at least a master lens and an objective lens and forms an image of an object to be photographed onto a photo sensing surface of said image pickup device;

moving means for moving said master lens in its optical axis direction while finely vibrating said master lens at a predetermined reference frequency;

high frequency component extracting means for extracting a high frequency component signal from a video signal which is output from said image pickup device;

vibration component detecting means for extracting a signal of a component based on said reference frequency from the high frequency component signal which is output from said high frequency component extracting means and for detecting a polarity and an amplitude of said extracted signal;



maximum position detecting means for detecting a position of the maximum value of the high frequency component signal on the basis of at least the polarity detected by said vibration component detecting means;

speed setting means for outputting a speed setting signal to change a speed of said master lens for a period of time when said master lens is moved by said moving means; and

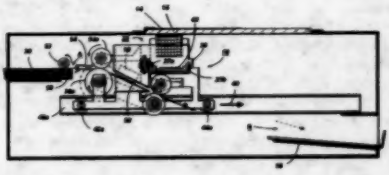
control means for controlling said moving means on the basis of an output signal of said speed setting means and an output signal of said maximum position detecting means.

4,920,421

SIMULTANEOUS READ/WRITE COPIER

Denis J. Stemmle, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 13, 1988, Ser. No. 257,366
Int. Cl.[5] H04N *1/024, 1/23*; G01D *15/16*
U.S. Cl. 358—296 **16 Claims**



1. In a system having a co-mounted unit of reading and printing elements, the method of making a copy of a document onto a copy sheet without information storage comprising the steps of:

scanning the co-mounted unit across the document and copy sheet in a first direction,

indexing the co-mounted unit a predetermined distance relative to the document and copy sheet in a second direction, and

repeating the scanning and indexing motion relative to the document and copy sheet, said scanning element reading a portion of said document during said movements across said document, and said printing element printing a por-

tion of a copy during said movement across said document wherein said reading and printing occur essentially simultaneously.

4,920,422

PROCESSES AND AUTOMATIC DEVICES FOR HIGH-RESOLUTION WRITING ON A SUPPORT BY PROJECTING DROPS OF COLORED LIQUIDS

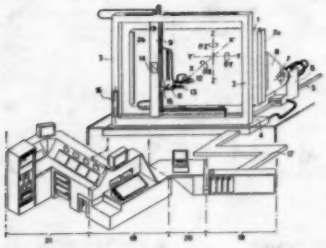
Gilles H. Lapierre, 33 rue de la République, 13500 Martigues, France

Filed Mar. 16, 1989, Ser. No. 324,607

Claims priority, application France, Mar. 18, 1988, 88 03767

Int. Cl.[5] H04N *1/393;* **G01D** *15/18;* **G06F** *15/62*

U.S. Cl. 358—296 **11 Claims**



1. A process for automatically writing a high-resolution polychrome graphic on a fixed support comprising the following successive operations:

mounting a plurality of nozzles, each projecting a liquid of a determined colour, on a tool-holder which is placed in front of said support and which is adapted to be displaced along three rectangular axes of which one is perpendicular to said support,

automatically controlling the displacements of said tool-holder by a central processing unit with the result that each outlet orifice of a nozzle scans line by line a surface parallel to said support, which nozzles are perpendicular to said support and parallel to one another and are offset in the direction perpendicular to the scanning lines, so that they scan different lines,

recording in the memory of said central unit the coordinates of a network of dots of the graphic and the colour of each dot and, during the displacements of the tool holder,

measuring the successive real positions of each nozzle,

comparing them with the coordinates recorded in the memory and, when the real position of a nozzle which projects a liquid of a determined colour coincides with the coordinates of a dot of the graphic of this same colour, the central unit causes the ejection of a drop of liquid via said nozzle onto said support so that a high-resolution polychrome graphic is obtained thereon which is composed of a network of juxtaposed monochromatic dots.

4,920,423

VIDEO PRINTER

Kazuo Shiota, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 5, 1988, Ser. No. 215,145

Claims priority, application Japan, Jul. 3, 1987, 62-167534

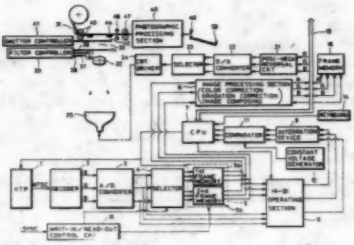
Int. Cl.[5] H04N *5/76*

U.S. Cl. 358—335 **15 Claims**

1. A video printer for making a hard copy of one of a plurality of continuous video images recorded in a video image recording medium, said video printer comprising:

means for detecting a value substantially corresponding to a degree of correlation between each pair of adjacent frames of said continuous video images reproduced time serially.

means for comparing said detected value with a preset value; and



means for making a hard copy of a frame which is reproduced a predetermined time period later if said comparing means outputs a comparison value indicative of said detected value being smaller than said preset value.

4,920,424

METHOD OF RECORDING AND REPRODUCING MULTI-CHANNEL INFORMATION ON AND FROM RECORDING MEDIUM

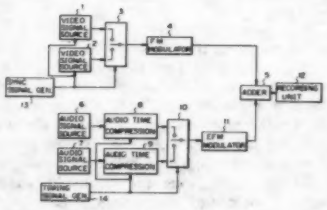
Sumio Hosaka; Toshiyuki Amaya; Toshiji Daito; Hiroshi Itoh, and Takumi Jinguji, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed May 26, 1988, Ser. No. 199,179

Claims priority, application Japan, Aug. 6, 1987, 62-196875

Int. Cl.[5] G11B *7/00;* **H04N** *5/76*

U.S. Cl. 358—343 **6 Claims**



1. A method of recording a plurality of channels of video signals and a plurality of channels of audio signals associated with said video signals, on a recording medium, comprising the steps of:

periodically sampling each video signal at consecutive unit periods, thereby obtaining consecutive unit period samples of each video signal;

combining the sampled video signals by a time division multiplexing operation to form a single multiplex video signal comprising every other one of said unit period samples of each of said video signals;

digitizing each of said audio signals into a series of digital data, each series corresponding to a particular audio signal of said plurality of channels of audio signals;

dividing each of said series of digital data into a plurality of data blocks and effecting a time compression of the data blocks by a predetermined factor;

compressing in time each of the data blocks in each of said series of digital data;

combining said compressed data blocks of each of said series of digital data thereby forming a single digitized audio signal; and

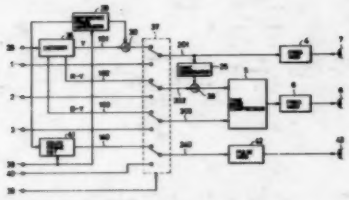
recording said multiplex video signal and said digitized audio signal at the same time on said recording medium.

4,920,425

VIDEO SIGNAL RECORDING AND REPRODUCING APPARATUS

Kunio Sekimoto, and Takeshi Morimoto, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Feb. 8, 1988, Ser. No. 153,406
Claims priority, application Japan, Feb. 9, 1987, 62-27730
Int. Cl.[5] H04N 9/80, 9/88
U.S. Cl. 358—334 10 Claims



1. A video signal recording and reproducing apparatus comprising:

(a) an input terminal receiving a video signal;

(b) means for recording the video signal, received by the input terminal, as component signals;

(c) means for generating a color frame signal from color frame information contained in the video signal received by the input terminal;

(d) means for recording the color frame signal generated by the generating means;

(e) means for reproducing the component signals recorded by the recording means (b) and for reproducing the color frame signal recorded by the recording means (d); and

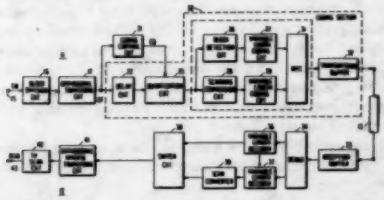
(f) output terminals outputting the component signals reproduced by the reproducing means and outputting the color frame signal reproduced by the reproducing means.

4,920,426

IMAGE CODING SYSTEM CODING DIGITAL IMAGE SIGNALS BY FORMING A HISTOGRAM OF A COEFFICIENT SIGNAL SEQUENCE TO ESTIMATE AN AMOUNT OF INFORMATION

Yoshinori Hatori, Kanagawa; Toshio Koga, Tokyo; Kiichi Matsuda, and Naoki Mukawa, both of Kanagawa, all of Japan, assignors to Kokusai Denshin Denwa Co., Ltd.; NEC Corporation; Fujitsu Limited and Nippon Telegraph and Telephone Corporation, all of Tokyo, Japan

Filed Nov. 9, 1987, Ser. No. 118,128
Claims priority, application Japan, Nov. 10, 1986, 61-267340
Int. Cl.[5] H04N 1/415, 1/413
U.S. Cl. 358—433 5 Claims



1. In an image coding system for use in coding a sequence of digital image signals into a sequence of coded signals, said digital image signal sequence being divisible into predetermined intervals of time, said image coding system comprising dividing means responsive to said digital image signal sequence for dividing said digital image signal sequence into a sequence of blocks within each of said predetermined intervals, converting means coupled to said dividing means for successively carrying out predetermined conversion of the digital image signals of said blocks in each predetermined interval to produce a sequence of coefficient signals representative of coefficients resulting from said predetermined conversion, controllable coding means which has a plurality of coding characteristics and which is responsive to said coefficient signal sequence and to a characteristic selection signal for coding said coefficient signal sequence into said coded signal sequence in accordance with a selected one of said coding characteristics that is indicated by said characteristic selection signal, coding control means responsive to said coefficient signal sequence for producing a coding control signal determined in relation to an amount of information carried by said coefficient signal sequence, and supplying means for supplying said coding control signal to said controllable coding means as said characteristic selection signal, the improvement wherein said coding control means comprises:

histogram forming means responsive to the coefficient signal sequence for forming a histogram representative of a distribution of said coefficients in each predetermined interval, said histogram forming means producing a histogram signal representative of said histogram; and

estimating means coupled to said histogram forming means and responsive to said histogram signal for estimating the amount of information carried by the coefficient signal sequence in every one of said predetermined intervals to produce, as said coding control signal, an estimation signal representative of a result of the estimation in every one of said predetermined intervals.

4. In an image coding system for use in coding a sequence of digital image signals into a sequence of coded signals, said digital image signal sequence being divisible into predetermined intervals of time, said image coding system comprising dividing means responsive to said digital image signal sequence for dividing said digital image signal sequence into a sequence of blocks within each of said predetermined intervals, controllable coding means which has a plurality of coding characteristics and which is responsive to said digital image signal sequence and to a characteristic selection signal for coding said digital image signal sequence into said coded signal sequence in accordance with a selected one of said coding characteristics that is indicated by said characteristic selection signal, coding control means responsive to said digital image signal sequence for producing a coding control signal determined in relation to an amount of information carried by said digital image signal sequence, and supplying means for supplying said coding control signal to said controllable coding means as said characteristic selection signal, the improvement wherein said coding control means comprises:

histogram forming means responsive to the digital image signal sequence for forming a histogram representative of a distribution of said digital image signals in each of said predetermined intervals, said histogram forming means producing a histogram signal representative of said histogram; and

estimating means coupled to said histogram forming means and responsive to said histogram signal for estimating the amount of information carried by the digital image signal sequence in every one of said predetermined intervals to produce, as said coding control signal, an estimation signal representative of a result of the estimation in every one of said predetermined intervals.

5. An image decoding system for use in combination with a coding system which produces a sequence of coded signals by dividing a sequence of digital image signals into a sequence of blocks in every one of predetermined intervals of time, by carrying out predetermined conversion of the digital image

signals of the blocks in every one of said predetermined intervals into a sequence of coefficient signals which are representative of coefficients resulting from said predeterimined conversion, by forming a histogram representing an amount of information carried by said coefficient signal sequence and producing a histogram signal representative of said histogram, and by coding said coefficient signal sequence into said coded signal sequence in accordance with said histogram signal, said image decoding system comprising:

decoding means for decoding said coded signal sequence into a reproduction of said coefficient signal sequence; and

inverse conversion means coupled to said decoding means for carrying out inverse conversion of said reproduction of said coefficient signal sequence relative to said predetermined conversion to produce a reproduction of said sequence of digital image signals.

4,920,427

FACSIMILE APPARATUS

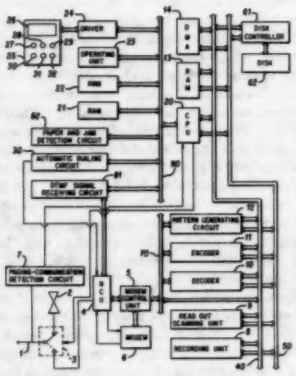
Yoshihiro Hirata, Koganei, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 240,440, Sep. 2, 1988, which is a continuation of Ser. No. 128,440, Dec. 3, 1987, abandoned, which is a division of Ser. No. 812,467, Dec. 23, 1985. This application May 22, 1989, Ser. No. 354,851

Claims priority, application Japan, Dec. 21, 1984, 59-268400; Dec. 21, 1984, 59-270463; Dec. 21, 1984, 59-270468

Int. Cl.[5] H04N *1/00*

U.S. Cl. 358—437 **4 Claims**



1. A facsimile apparatus comprising:

storing means for storing received picture image information;

printing means for printing out picture image information;

trouble detecting means for detecting a trouble occurrence at the printing means; and

control means for causing, when the trouble detecting means detects a trouble occurrence at the printing means, the printing means to print out picture image information on the basis of the picture image information stored in the storing means, after the trouble occurrence is eliminated.

4,920,428

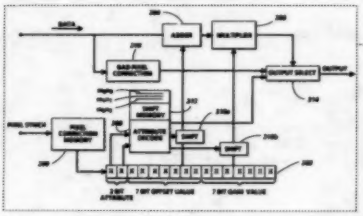
OFFSET, GAIN AND BAD PIXEL CORRECTION IN ELECTRONIC SCANNING ARRAYS

Ying-wei Lin, Penfield, and Anthony F. Calarco, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 8, 1988, Ser. No. 216,475

Int. Cl.[5] H04N *1/40*

U.S. Cl. 358—461 **21 Claims**



1. An image scanning device having a scanning array with a plurality of photosites detecting light from an image, each photosite producing a response indicative of light intensity, and including means for correction of responsivity of the photosites, comprising:

a memory storing correction values for photosites along the array;

correction means for applying said correction values to the responses from the photosites;

said correction values each including a correction portion and an attribute value;

means to apply said correction portions to the photosite responses;

a decoder for detecting said attribute values;

shift means for shifting said correction portions prior to application to the photosite responses by a selected number of places, said shift means responsive to detection by said decoder of attribute values indicating that shifting should occur.

19. A method of correcting the responsivity of photosites in an image scanning device having a scanning array with a plurality of photosites detecting light from an image, each photosite producing a response indicative of light intensity, said method comprising the steps:

storing binary values for correction of offset and gain of photosite responses along the array in a

21. A method of correcting the responsivity of photosites in an image scanning device having a scanning array with a plurality of photosites detecting light from an image, each photosite producing a response indicative of light intensity, said method comprising:

for each photosite response correctable to a normalized value, storing a correction value in a correction memory to be applied to the photosite response for correction thereof;

for each photosite response not correctable to a normalized value, storing a distinctive value in said correction memory indicating that an approximated photosite response should be substituted for the actual photosite response;

detecting each said distinctive value and enabling a photosite response approximation function to produce an approximated photosite response;

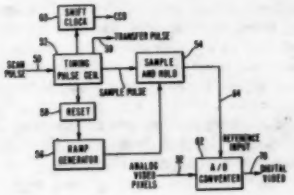
applying each correction value to the associated photosite response to correct said photosite response to a normalized value;

substituting each approximated photosite response for the associated actual photosite response not correctable to a normalized value.

4,920,429
EXPOSURE COMPENSATION FOR A LINE SCAN CAMERA

Robert S. Jaffe, Shenorock; Mark A. Lavin, Katonah; Rick A. Rand, Somers, and Paul Schreiner, New York, all of N.Y., assignors to International Business Machines, Armonk, N.Y.

Filed Jan. 24, 1989, Ser. No. 301,622
Int. Cl.[5] H04N 1/40
U.S. Cl. 358—471 9 Claims



1. In a scanning imager which includes a line camera and motive means to present successive regions of an item to be imaged to said line camera, initiation means associated with said motive means for controlling time of exposure of said camera for each said region, said initiation means subject to motion variations of said motive means to vary the time between successive operations of said camera and exposure times for successive regions, thereby producing analog image pixel outputs exhibiting exposure variations, an exposure correction system comprising:

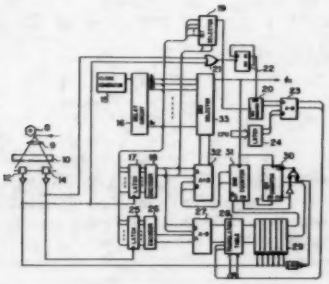
means responsive to a signal from said initiation means for generating a signal related to the time between successive operations of said camera; and

conversion means responsive to said signal to normalize said analog image pixel outputs.

4,920,430
METHOD OF AND APPARATUS FOR JITTER CORRECTION OF A POLYGON MIRROR IN AN IMAGE RECORDING APPARATUS

Koichi Isono, Otsu; Kunio Towohisa, Kyoto; Junichi Oka, Hikone, and Takashi Sakamoto, Otsu, all of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Division of Ser. No. 113,743, Oct. 28, 1987, Pat. No. 4,872,065. This application May 18, 1989, Ser. No. 353,850
Claims priority, application Japan, Oct. 29, 1986, 257727; Nov. 21, 1986, 61-279288
Int. Cl.[5] H04N 1/04
U.S. Cl. 358—481 8 Claims



1. A method of performing polygon mirror image recording jitter correction by using a polygon mirror to scan a recording beam modulated in synchronization with a dot recording clock signal for recording an image on a photosensitive material, said method comprising the steps of:

generating a plurality N of dot recording clock signals by delaying a dot recording clock signal of a cycle time t by t/N;

detecting said recording beam by a start sensor in advance of scanning one scanning line;

detecting passage of said recording beam after completion of said scanning of one scanning line by an end sensor;

counting an interval between detection times when said beam impinges on said start and end sensors with a time resolution of t/N for each surface of said polygon mirror to obtain a difference between a counted value and a prescribed reference count value as a number of clock crossover times with a sign of said difference as a crossover phase direction;

selecting one of said N dot recording clock signals in synchronization with a detection output of said start sensor for each surface of said polygon mirror;

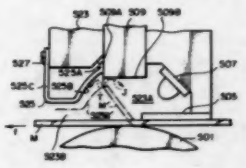
generating a crossover dot recording clock signal by performing a crossover correction from said selected dot recording clock signal sequentially to a dot recording clock signal adjacent in phase to said selected dot recording clock signal by said number of clock crossover times in said crossover phase direction; and

performing image recording by said crossover dot recording clock signal.

4,920,431
IMAGE READING APPARATUS WITH JAM-PREVENTION FEATURE

Makoto Ogura; Tatsundo Kawai; Katsuhiko Yamada, all of Hiratsuka, and Shinichi Seito, Isehara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 751,128, Jul. 2, 1985, abandoned. This application Jan. 11, 1988, Ser. No. 144,644
Claims priority, application Japan, Jul. 14, 1984, 59-145256; Jul. 31, 1984, 59-158659
Int. Cl.[5] H04N 1/12, 1/028
U.S. Cl. 358—496 17 Claims



1. An image reading apparatus for reading an original conveyed along a predetermined path by a conveying means having a roller provided adjacent a predetermined reading position, said apparatus comprising:

means for reading a portion of the original located at the predetermined reading position in the predetermined path;

a light source for illuminating the portion of the original located at said predetermined reading position; and

original guiding means provided at a side of said means for reading and downstream of said predetermined reading position along the predetermined path along which the conveying means conveys the original;

wherein said original guiding means is so disposed and so shaped that it non-nippingly guides the leading edge of the original being conveyed to prevent the leading edge of the original from catching on and being jammed by said original guiding means; and

wherein said original guiding means comprises a guide surface which is non-convex as seen from said predetermined reading position.

6. An image reading apparatus for reading an original conveyed by a conveying means along a predetermined path, said apparatus comprising:

means for reading a portion of the original located at a predetermined reading position in the predetermined path;

a light source for illuminating the portion of the original located at said predetermined reading position; and

original guiding means provided downstream of said predetermined reading position along the predetermined path along which the conveying means conveys the original;

wherein said apparatus has a portion located downstream along the predetermined path from said predetermined reading position and out of the predetermined path, said portion being so positioned and so shaped that the leading edge of the original being conveyed past said predetermined reading position by the conveying means could catch on and be jammed by said portion if not prevented from doing so;

wherein said original guiding means is so disposed and so shaped that it non-nippingly guides the leading edge of the original being conveyed to prevent the leading edge of the original from catching on and being jammed by said portion of said apparatus; and

wherein said original guiding means comprises an original guide roller which non-nippingly guides the original.

4,920,432

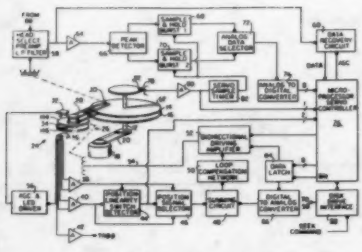
SYSTEM FOR RANDOM ACCESS TO AN AUDIO VIDEO DATA LIBRARY WITH INDEPENDENT SELECTION AND DISPLAY AT EACH OF A PLURALITY OF REMOTE LOCATIONS

Derek C. Eggers; David V. Holben, both of 4217 Highland Rd., Suite 275, Pontiac, Mich. 48054, and Mark E. Robinson, 1080 Cliff Dr., Lapeer, Mich. 48446

Filed Jan. 12, 1988, Ser. No. 143,575

Int. Cl.[5] H04N *5/78, 7/16;* G11B *15/68*

U.S. Cl. 360—33.1 3 Claims



1. A system for providing selective random access to a library of segments of prerecorded audio-video data for display at any of a plurality of remote locations, the system comprising:

a plurality of user display means, one at each of said remote locations for displaying an audio video signal at said location;

an audio-video data library comprising a plurality of discrete audio-video record items, each containing prerecorded audio-video data;

filer means including a housing having a plurality of storage sites each adapted to receive an audio-video data record item;

a plurality of playback devices located at said filer means, each adapted to generate an audio-video signal from an audio-video record item operatively associated therewith;

a cable network interconnecting said playback devices and user display means for the purpose of transfering audio-video signals between playback devices and user display means;

retriever means operatively associating any selected record item in a storage site with an available one of said playback devices for playback, and disassociating said record item there from after playback;

selection means including a user interface means included in each user display means for selecting a particular segment of audio-video data in said library for playback, said selection means further including means controlling said retriever means to cause a particular record item having said particular segment of audio-video data thereon to be played back by an available one of said playback devices and causing said audio-video signal to be read out at said user video display means at said location whereat said selection is made;

signal combiner means causing said generated audio-video signals from each playback device to be transmitted onto said cable network at a unique frequency;

each of user display means including tuner means able to tune to any of said frequencies transmitted onto said cable network and demodulate signals from a single playback device;

supervisory computer means monitoring the availability of playback devices and audio-video record items and causing said retriever means to transport a selected data record item to an available playback device;

a data communications network separate from said cable network interconnecting said user display means, said playback devices, and said supervisory computer means for the purpose of internal system communications;

said supervisory computer means also including means for causing said user display means at said location to tune to said frequency of said assigned playback device by sending instructions via said data communications network.

4,920,433

ROTARY RECORDING/PLAYBACK HEAD ANGULAR POSITION CORRECTION APPARATUS

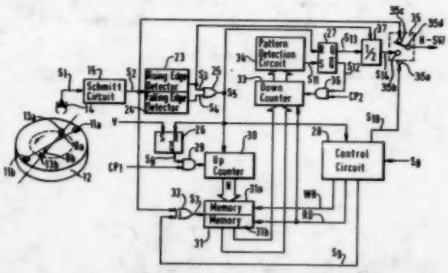
Kenji Ito, Fukaya, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Mar. 25, 1987, Ser. No. 29,907

Claims priority, application Japan, Mar. 31, 1986, 61-72812

Int. Cl.[5] G11B *15/14*

U.S. Cl. 360—64 11 Claims



1. A rotary recording/playback head angular position correction apparatus for outputting an angular position indicating signal in a data reproduction machine having a rotary head element rotatably positioned in a rotary plane for reproducing data, the data including a reference signal, said apparatus including:

angular position detection means for producing a detection signal in response to detection of an angular position of the rotary head element;

counting means operatively coupled to said rotary head element and to said angular position detection means for

measuring a time difference between receipt of the detection signal and receipt of the reference signal;

memory means operatively coupled to said counting means for storing the time difference; and

adjustment means operatively coupled to said memory means for generating and outputting the angular position indicating signal in accordance with the time difference.

4,920,434
FIXED DISK DRIVE

David A. Brown, Saratoga, Calif.; Donald V. Daniels, Friday Harbor, Wash., and Joel N. Harrison, Monte Sereno, Calif., assignors to Quantum Corporation, Milpitas, Calif.

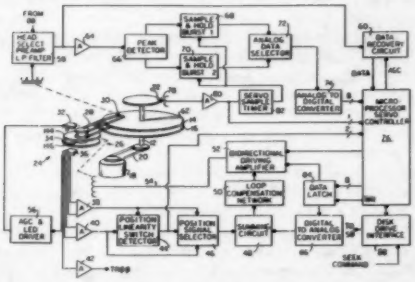
Continuation of Ser. No. 326,166, Mar. 20, 1989, Pat. No. 4,872,074, which is a continuation of Ser. No. 150,994, Feb. 1, 1988, Pat. No. 4,814,909, which is a continuation of Ser. No. 28,977, Mar. 23, 1987, abandoned, which is a continuation of Ser. No. 496,924, May 23, 1983, Pat. No. 4,660,106, which is a continuation of Ser. No. 190,198, Sep. 24, 1980, now Re. 32,075.

This application Jun. 9, 1989, Ser. No. 364,810

The portion of the term of this patent subsequent to Aug. 2, 2000, has been disclaimed.

Int. Cl.[5] G11B *21/08, 21/10*; H02K *37/00*

U.S. Cl. 360—77.08 **30 Claims**



1. A disk drive for increasing the density or concentric storage tracks on a data storage surface of a rotating data storage disk without requiring a disk servo surface, the disk drive comprising:

an enclosed housing,

at least one disk rotatably mounted within the housing,

each such disk having concentric data storage tracks on each surface thereof,

motor means for rotating the disk at a predetermined angular velocity,

at least one data head for reading and writing user data from and to each data storage surface while flying in close proximity thereto,

a mass balanced electromechanical rotary actuator structure mounted within the housing, the data head being mounted on and positioned by the rotary actuator structure,

an optical polyphase head position transducer coupled closely to the rotary actuator structure and the housing for generating plural phase cyclical signals in quadrature, a selected one of the phase signals providing a servo reference for track following, at least four adjacent storage track locations being included within a range of movement of the actuator structure relative to the housing and disk within one cycle of one of the plural phases,

position linearity switch detector means connected to the optical polyphase head position transducer for generating storage track location signals from the plural phase signals,

position signal selector means connected to the optical polyphase head position transducer and the position linearity switch detector means for selecting one of the phase signals as the servo reference corresponding to a selected storage track location for track following,

track seeking means which includes controller means and bidirectional driving amplifier means and which is responsive to the location signals, for controlling the actuator structure to move the data head to selected storage track locations,

at least one storage surface being recorded with head position correction information which is readable by the data head,

the controller means comprising: (a) means for causing the data head to read the correction information, (b) means for processing the correction information, and (c) means for putting out a correction value for the selected storage track location for track following,

a head positioner circuit including summing junction means for combining the selected one of the phase signals from the position signal selector means and the correction value from the controller means to produce a position signal, and further including the bidirectional driving amplifier means for driving the electromechanical rotary actuator structure in response to the position signal during track following,

interface means for providing data selection information from a host computing system for transferring data between the host computing system and the data storage surface via the data head.

4,920,435
MAGNETIC RECORDING AND REPRODUCING DEVICE WITH IMPROVED TRACK SERVO

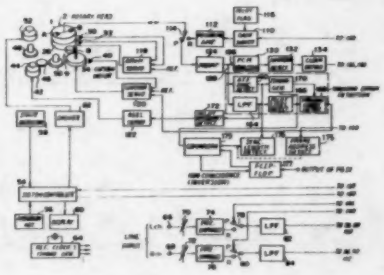
Shohei Yamazaki, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Jan. 25, 1988, Ser. No. 147,448

Claims priority, application Japan, Jan. 27, 1987, 62-16385

Int. Cl.[5] G11B *5/52, 5/58*

U.S. Cl. 360—77.15 **8 Claims**



1. A magnetic recording and reproducing device comprising:

a rotary head incorporating a plurality of heads of different azimuths for recording and reproducing an input signal by tracing tracks of a magnetic recording medium, said heads also reproducing signals recorded on left and right adjacent tracks simultaneously with reproduction from a desired track, and data recorded on each track of said magnetic recording medium including the input signal, a synchronizing signal used for timing control of recording and reproducing of said input signal and a pilot signal of a predetermined frequency used for tracking control, the synchronizing signal having a form which is different alternately in a series of a tracks of the same azimuth; and

tracking control means comprising:

tracking error signal generation means for generating, based on timing of said synchronizing signal, a tracking error signal by detecting crosstalk components of the pilot

signals on left and right adjacent racks and comparing these components with each other;

relative speed control means for controlling, responsive to the tracking error signal, a relative speed of said magnetic recording medium with respect to said heads of said rotary head;

synchronizing signal form detection means of detecting the form of the synchronizing signal which has been reproduced by said heads;

synchronizing signal form designation means for producing a signal which is inverted each time said rotary head has scanned two tracks of said magnetic recording medium and designating the form of the synchronizing signal with this signal; and

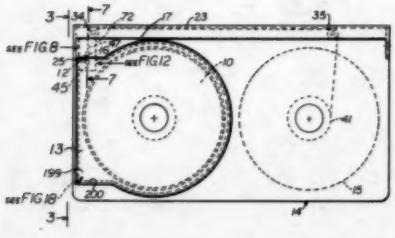
synchronizing signal form coincidence/non-coincidence detecting means for detecting coincidence or non-coincidence in the form of the synchronizing signal on the basis of the detection by said synchronizing signal form detecting means and the designation by said synchronizing signal form designation means and for causing the tracking control to be controlled in accordance with result of detection of coincidence or non-coincidence in the form in such a manner that the tracking control is applied during coincidence and the tracking control is not applied and the designation signal of said synchronizing signal form designation means is inverted during non-coincidence.

4,920,436

MAGNETIC TAPE CASSETTE SYSTEM

Warren D. Novak, Chappaqua, N.Y., assignor to Rank Video Services America, Northbrook, Ill.

Filed Jun. 24, 1988, Ser. No. 211,545
Int. Cl.[5] G11B *15/66*
U.S. Cl. 360—96.1 **133 Claims**



1. In a method of providing magnetic tape for use in standardized apparatus designed to receive tape of that kind in a two-reel-type cassette for transducing signals relative to the tape, the improvement comprising in combination the steps of:

providing said magnetic tape with a first tape coupling device;

loading said magnetic tape and first tape coupling device into a one-reel-type cartridge;

providing the cassette with a takeup reel;

providing said takeup reel in said cassette with a second tape coupling device interconnectable with said first tape coupling device and adapting said first and second tape coupling devices for automatic interconnection upon insertion of said loaded cartridge into said cassette; and

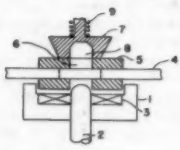
providing the cassette with space for receiving said loaded cartridge in lieu of a tape supply reel and for said automatic interconnection of said first and second tape coupling devices by insertion of said loaded cartridge into said cassette space.

4,920,437

DISC CLAMPING DEVICE

Junichi Washo, Ikoma; Shigeo Terashima, Tenri; Toshihisa Deguchi, Nara; Masahiro Horii, Nara; Takao Hyuga, Nara, and Kenji Ohta, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 25, 1987, Ser. No. 29,610
Claims priority, application Japan, Mar. 25, 1986, 61-67640
Int. Cl.[5] G11B *17/028, 5/012*
U.S. Cl. 360—99.05 **4 Claims**



1. A disc clamping device capable of clamping a disc with or without a centering hub comprising;

a rotatably mounted disc base for supporting an information recording disc;

a spindle extending from the center of said disc base and fixed thereto, said spindle having a center line;

a disc holding member spaced above said spindle and supported for movement in an axial direction along a center line thereof toward said spindle;

said spindle center line and said disc holding member center line being in alignment;

said disc base including magnetic means positioned around said spindle for interaction with any disc having a hub made of a ferromagnetic substance; and

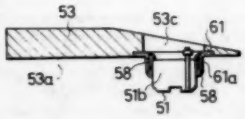
said disc holding member including means for pressing a disc with a centering hub against said disc base and separate means for engagement with the center hole of a disc with no centering hub in order to press such a disc against said disc base.

4,920,438

MAGNETIC HEAD UNIT AND METHOD OF MANUFACTURING THE SAME

Masatoshi Furukawa, Nagaoka, and Kazuo Kobayshi, Furukawa, both of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 925,825, Oct. 30, 1986, abandoned.
This application Apr. 6, 1989, Ser. No. 334,788
Claims priority, application Japan, Oct. 30, 1985, 60-241654
Int. Cl.[5] G11B *5/48*
U.S. Cl. 360—104 **2 Claims**



1. A magnetic head and slider assembly comprising:

a magnetic head including a slider having side surfaces;

a magnetic head and slider supporting member having a portion defining a receiving hole for said magnetic head and slider;

a mount attached to said supporting member having a tubular portion formed as a hollow elongated cylinder for loosely receiving said magnetic head and slider, said tubu-

lar portion having an inner surface surrounding said side surfaces of said slider;

an adhesive for attaching said side surfaces of said slider to the inner surface of said tubular portion of said mount.

4,920,439

GUIDE ELEMENT STRUCTURE ENGAGEABLE IN SLIDING CONTACT WITH A MAGNETIC SUPPORT

Abramo Bordignon, Via Palmiro Togliatti, 32 - 20030 Senago (Province of Milan), Italy

Filed May 16, 1988, Ser. No. 194,600

Claims priority, application Italy, Jun. 1, 1987, 20743 A/87

Int. Cl.[5] G11B *13/60*; B65H *23/04*

U.S. Cl. 360—130.21 **13 Claims**

1. In combination, a magnetic tape and a magnetic tape guide element, comprising:

a body positioned adjacent to said magnetic tape,

at least one portion defined on said body, and

a plurality of monofilaments each having an end and a free end, said monofilaments being located at least at said one portion of said body, said end of each of said monofilaments being fixed to said body, said free end of eachof said monofilaments engaging said magnetic tape, in sliding contact engagement therewith.

4,920,440

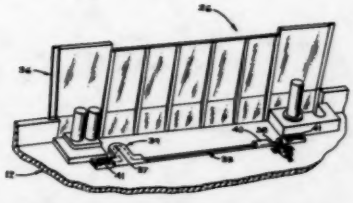
COMPOSITE LID ASSEMBLY

James H. Andrews, Opelika, Ala., assignor to Ampex Corporation, Redwood City, Calif.

Filed Dec. 22, 1988, Ser. No. 288,516

Int. Cl.[5] G11B *23/087*; B65D *45/16*

U.S. Cl. 360—132 **6 Claims**



1. A tape cassette having a supply reel for holding a supply of tape at a first position for transport to a take up reel for receiving the tape transported from the supply reel, the cassette comprising:

a housing having a top wall, a bottom wall and associated side walls defining an interior for rotatably supporting respective supply reel and takeup reel therein;

a sidewall portion defining an opening in the cassette;

means for guiding tape between said reels and across said opening to provide a tape access area at the opening, said access opening permitting the withdrawal of the tape from the cassette; and

a composite lid assembly mountable on the cassette at the opening to close the tape access area, said composite lid assembly including a door and a hinge assembly integral with the door, said hinge assembly including a longitudinal hinge pin having opposite ends, a first torsion spring element disposed at one end of the hinge pin and mounted in the door to be integral therewith, a second torsion spring element disposed at an opposite end of the pin for mounting on the cassette, and said opposite ends of the hinge pin fixedly mountable on the cassette so as to position said first and second torsion spring elements to retain the door in a closed position with respect to the cassette.

4,920,441

FLEXIBLE MAGNETIC DISKETTE

Takashi Kimura, Kawasaki; Kenichi Chihara, Yokohama; Masahiro Tomatsu, Yokohama; Kazunobu Inoue, Yokohama; Norio Yano, and Osamu Adachi, both of Yokosuka, all of Japan, assignors to Nippon Telegraph and Telehpone Corp., Tokyo; Fujitsu Limited, Kawasaki and Fujitsu Kasei Ltd., Yokohama, all of, Japan

Continuation of Ser. No. 839,035, Mar. 12, 1986, abandoned.

This application May 20, 1988, Ser. No. 196,866

Claims priority, application Japan, Mar. 13, 1985, 60-048165

Int. Cl.[5] G11B *23/02, 5/82*

U.S. Cl. 360—133 **22 Claims**

1. A flexible magnetic diskette for magnetically storing various information recorded and read by a magnetic head and engagable with and rotationally driven by a driving unit, said diskette comprising:

a plastic disk sheet having two sides which are uniformly coated with magnetic material and having a mount hole at a center thereof and including a periphery; and

holding means, mounted at the periphery of said mount hole, for securing said plastic disk sheet, said holding means comprising:

a holder body, made of plastic and held to said flexible disk sheet at the periphery of said mount hole;

a double-sided adhesive ring between said holder body and one side of said plastic disk sheet, adhesively securely said plastic disk sheet to said holder body; and

a core member, made of magnetic metal having a high abrasive resistance, rigidly attached to said holder body and spaced from said plastic disk sheet, a center of the core member aligning with the center of said plastic disk sheet,

wherein said holder body and said core member each have corresponding shaft insert holes passing therebetween through which the center shaft is inserted, and the disk sheet is thus positioned relative to the magnetic head.

4,920,442

RELEASABLE SERVO WRITING FIXTURE CONNECTOR

Walter S. Dimmick, Atherton, Calif., assignor to Quantum Corporation, Milpitas, Calif.

Filed Sep. 8, 1988, Ser. No. 242,067

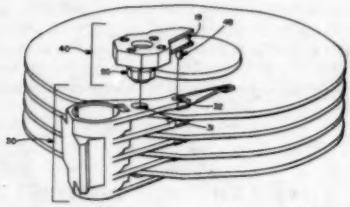
Int. Cl.[5] G11B *00/00*

U.S. Cl. 360—137 **18 Claims**

1. An apparatus for temporarily attaching a servo writing tool to a head transducer arm assembly of a rigid disk drive, the

arm assembly defining a topmost arm having a plurality of attachment locations, comprising:

a body for supporting the tool in prearranged alignment;



releasable engagement means for engaging the topmost arm at the attachment locations; and

registration means for alignment registration of the body.

4,920,443

ELECTRICAL PROTECTION ASSEMBLIES

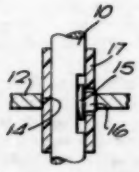
Brian Shepherd, Wendover, England, assignor to Smiths Industries Public Limited Company, London, England

Filed Oct. 24, 1989, Ser. No. 427,212

Claims priority, application United Kingdom, Nov. 25, 1988, 8827627

Int. Cl.[5] H02H 9/04

U.S. Cl. 361—56 **10 Claims**



1. An electrical assembly comprising: a plurality of electrical conductors; a first common electrical plane; a plurality of first unidirectional current. devices connected between the plane and respective ones of the conductors in the same sense; a second common electrical plane; a plurality of second unidirectional current devices connected between said second plane and said conductors in the opposite sense to said first unidirectional current devices; first and second energy-dissipating means; and means connecting said energy-dissipating means between ground and respective ones of the electrical planes such that an excessive positive voltage excursion on any one of the said conductors is conducted via a respective one of said first unidirectional current devices to said first plane and from said first plane to ground via the first energy-dissipating means, and such that an excessive negative voltage excursion on any one of said conductors is conducted via a respective one of said second unidirectional current devices to said second plane and from said second plane to ground via the second energy-dissipating means.

4,920,444

ARRANGEMENT FOR DECOUPLING INTEGRATED CIRCUITS ELECTRICALLY

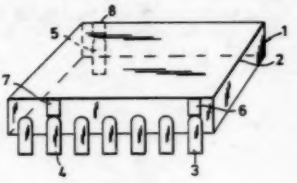
Alf Friman, Växjö , Sweden, assignor to Carmis Enterprises S.A., Geneva, Switzerland

Filed Oct. 3, 1988, Ser. No. 251,640

Claims priority, application Sweden, Oct. 9, 1987, 8703913

Int. Cl.[5] H08H 3/20

U.S. Cl. 361—56 **3 Claims**



1. An arrangement for electrically decoupling integrated circuits (1) by means of decoupling capacitors located between an earth connection (3) and at least one of a signal output (4) and a supply conductor (5), characterized in that at least the major part of an upper surface or a bottom surface of such an integrated circuit (1) is covered with a metal foil (2) which is connected at an edge to the earth connection (3) of the circuit by means of a short conductor (6), and to at least one of said circuit signal output (4) and said supply conductor (5) via the decoupling capacitors (7, 8) which are also connected to the foil edges.

4,920,445

JUNCTION-BREAKDOWN PROTECTION SEMICONDUCTOR DEVICE

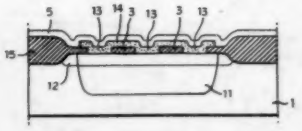
Dong Soo Jun, Taegu, Rep. of Korea, assignor to Samsung Semiconductor and Telecommunications Co., Ltd., Gumi, Rep. of Korea

Filed Nov. 17, 1987, Ser. No. 121,843

Claims priority, application Rep. of Korea, Nov. 19, 1986, 86-9799

Int. Cl.[5] H02H 3/20

U.S. Cl. 361—91 **4 Claims**



1. In a semiconductor integrated circuit, a structure for preventing an electrical discharge breakdown at the junction of a metal pad conductor and a non-metallic conductive region of said semiconductor comprising;

a semiconductor substrate having a first conductivity type;

a first semiconductor region of high impurity concentration and having a conductivity type opposite to that of said first conductivity type;

an insulating film over said first semiconductor region and having a plurality of openings therein;

a metal pad conductor over said insulating film and extending through said plurality of openings to make electrical contact with said first semiconductor region; and

a second semiconductor region of the same conductivity type as said first semiconductor region formed under said pad conductor and said first semiconductor region to a

depth substantially deeper than said first semiconductor region.

4,920,446

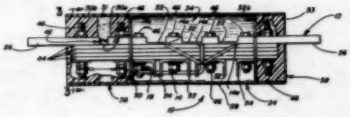
PYROTECHNICALLY-ASSISTED CURRENT INTERRUPTER

Herbert M. Pflanz, Westwood, Mass., assignor to G & W Electric Co., Blue Island, Ill.

Continuation of Ser. No. 853,695, Apr. 18, 1986, abandoned. This application Sep. 27, 1988, Ser. No. 252,014

Int. Cl.[5] H02H *3/00*; H01H *37/76*

U.S. Cl. 361—93 **7 Claims**



1. Apparatus for selectively interrupting electric current comprising:

elongation bus means;

explosive means for segmenting said bus means;

resistive means connected in series with said bus means;

detonator means in parallel with said resistive means to detonate said explosive means in response to current flow through said detonator means above a predetermined level resulting from current flow through said apparatus in excess of a predetermined trigger level; and

adjustable control means to permit presetting of said trigger level;

said control means including a plurality of control elements having resistance which varies in response to voltage, and manually operable switch means for selectively shunting current around one or more of said control elements to provide stepwise adjustment of the sensitivity of the apparatus.

4,920,447

METHOD FOR PROTECTING THE GATE UNIT FOR A GTO THYRISTOR

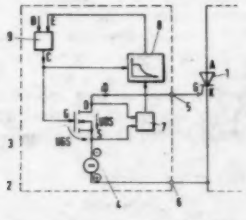
Michael Peppel, Weinheim, Fed. Rep. of Germany, assignor to BBC Brown Boveri AG, Baden, Switzerland

Filed Dec. 8, 1988, Ser. No. 281,516

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1987, 3741713

Int. Cl.[5] H02H *7/12*, *3/08*

U.S. Cl. 361—93 **6 Claims**



1. Method for protecting the gate unit for a GTO thyristor, in which a controllable electronic switch operates to turn off the GTO thyristor by means of an erase pulse, comprising the step of:

detecting a voltage drop across said controllable electronic switch;

comparing in an evaluation device the voltage drop with a given threshold curve, wherein said threshold curve is defined on the basis of the maximal short term load carrying capacity of said electronic switch, during which term the threshold curve has a constant value in a first time interval immediately after switching on said electronic switch, which is never reached during normal operation, but is exceeded in case of a short-circuit at the output of said electronic switch; and wherein said threshold curve is further defined on the basis of the long term load-carrying capacity of said electronic switch, during which term the value of the threshold curve is reduced to a lower value than said constant value, during a second time interval following said first time interval; and

blocking said electronic switch at the moment the voltage drop across said electronic switch exceeds a value of said threshold curve.

4,920,448

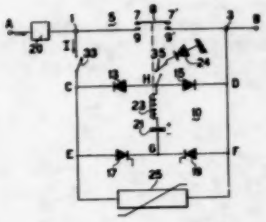
SEMICONDUCTOR-ASSISTED ULTRA-FAST CONTACT BREAKER

Henri Bonhomme, Ans, Belgium, assignor to Acec Transport S.A., Charleroi, Belgium

Filed Jan. 6, 1988, Ser. No. 141,225

Int. Cl.[5] H02H *3/00*

U.S. Cl. 361—102 **9 Claims**



1. An ultra-fast contact breaker including an ultra-fast cut-off mechanism provided with a repulsion disk fitted with moving contacts, the said mechanism also including fixed contacts, to input and output terminals of which there is connected an assistance circuit including a capacitor and a coil as well as a group of semiconductors, the coil wholly or partly constituting a repulsion coil of said ultra-fast mechanism, the assistance circuit having at least two parallel branches, a first of said branches including two opposed diodes or similar in series, each directed in a non-conducting direction for current entering the circuit, a second of said branches including two opposed thyristors or similar, each directed in a conducting direction for current entering the circuit, and an LC oscillating circuit formed by said capacitor and said coil which connects a common point of the two diodes or similar and a common point of the two thyristors or similar, the two thyristors or similar being remote controlled or controlled via a current sensor which is built in and which detects the exceeding of a previously fixed triggering threshold which can be adjusted in control electronics.

4,920,449

CONDUCTIVE BONDING OF COMPOSITE STRUCTURES

James H. Covey, Snohomish, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jan. 19, 1988, Ser. No. 145,048

Int. Cl.[5] H05F *3/02*

U.S. Cl. 361—216 **17 Claims**

1. An apparatus for preventing the destruction of gra-

phite/epoxy composite material in an aircraft structure when said aircraft structure is struck by lightning comprising:

a first graphite/epoxy composite member coupled to said aircraft structure, said first composite member having an insulating surface region and an inner region including a plurality of individual conductive fibers;

a second graphite/epoxy composition member coupled to said aircraft structure, said second composite member having an insulating surface region and an inner region including a plurality of individual conductive fibers;

a fastener means having threads for attaching the first composite member to the second member, the fastener means contacting said surface region and being threadably coupled with an interface fit to the inner regions of both members for providing good electrical conductivity between the fastener means and individual fibers within each of the two members to prevent arcing between the fastener means and the composite members when lightning strikes said apparatus; and

a member of good electrical conductivity coupled to the fastener means.

4,920,450

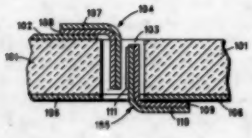
TEMPERATURE DEPENDENT CAPACITOR

Joseph Masiulis, Elmhurst, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 23, 1989, Ser. No. 370,535

Int. Cl.[5] H01G *7/00;* **H01P** *5/107;* **H05K** *1/18*

U.S. Cl. 361—282 **4 Claims**



1. On a substrate having a first conductive surface and a second conductive surface separated by a dielectric material, and having an opening at least through the dielectric material, a temperature dependent capacitor comprising:

a first plate having a proximal portion operatively connected to the first conductive surface and a distal portion extending into the opening;

a second plate having a proximal portion operatively connected to the second conductive surface and a distal portion extending into the opening, such that the distal portions of the first and second plates move with respect to one another in response to changes in temperature to provide a temperature dependent capacitance between the first and second conductive surfaces.

4,920,451

MOISTURE-SENSITIVE ELEMENT

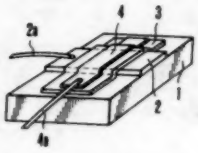
Yoshiro Sakai; Yoshihiko Sadaoka, both of Ehime; Takaai Kuroiwa, Kanagawa; Tooru Abe, Kanagawa, and Tetsuya Miyagishi, Kanagawa, all of Japan, assignors to Yamatake-Honeywell Co., Ltd., Tokyo, Japan

Filed May 18, 1989, Ser. No. 353,903

Claims priority, application Japan, May 23, 1988, 63-66813[U]; Jun. 14, 1988, 63-144665; Aug. 17, 1988, 63-203154

Int. Cl.[5] H01G *5/20;* **G01N** *25/64*

U.S. Cl. 361—286 **8 Claims**



7. A humidity detector, wherein at least one opening portion is formed in a case housing a moisture-sensitive element, and a hydrophobic filter is arranged on said opening portion via a bonding agent, said moisture-sensitive element comprising a moisture-sensitive film consisting of a polymer prepared by polymerizing a methacrylate monomer not having a hydroxyl group.

4,920,452

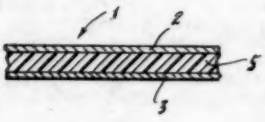
METALLIZED CAPACITOR WITH CORROSION RESISTANT ELECTRODES

Donald V. Lackey, Salt Point, N.Y., assignor to Dunmore Corporation, Brewster, N.Y.

Filed Sep. 18, 1989, Ser. No. 408,808

Int. Cl.[5] H01G *1/017*

U.S. Cl. 361—305 **13 Claims**



1. A capacitor adapted to inhibit corrosion in the presence of high AC voltages, said capacitor including

a foil dielectric, electrode coatings on at least one side of said foil dielectric, said electrode coatings being formed of an aluminum alloy,

said alloy containing aluminum, from about 0.2% to about 8.0% by weight of copper, and from about 0.2% to about 3% by weight of a metal having a higher valence than aluminum.

4,920,453

PROGRAMMABLE CONTROLLER MODULE

Kazuhiko Onose, Aichi, Japan, and Willard B. Ott, New Berlin, Wis., assignors to Allen-Bradley Company, Inc., Milwaukee, Wis. and Nippondenso Company, Ltd., Japan

Filed Oct. 13, 1988, Ser. No. 257,400

Int. Cl.[5] H05K *7/00*

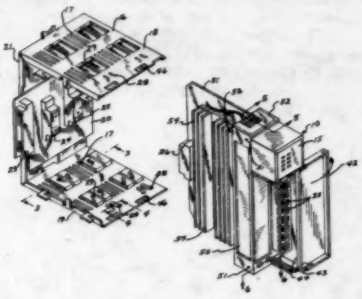
U.S. Cl. 361—392 **4 Claims**

1. A module for electrical connection to a rack forming part of a programmable controller which comprises:

a body member having a display portion and a circuit board connector portion;

a circuit board connected to said body member connector portion;

a door hingedly attached to said body member; and



snap fitment means extending from said body member for engagement with an engageable surface of an electrical rack forming a part of a programmable controller, said snap fitment means including a biased latch arm pivotally attached to said body member for releasable engagement with the engageable surface of the rack by a pivoting of said arm.

4,920,454

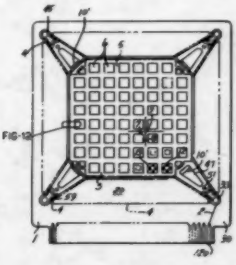
WAFER SCALE PACKAGE SYSTEM AND HEADER AND METHOD OF MANUFACTURE THEREOF

Herbert Stopper, Orchard Lake, and Cornelius C. Perkins, Birmingham, both of Mich., assignors to Mosaic Systems, Inc., Troy, Mich.

Continuation of Ser. No. 581,975, Feb. 21, 1984, abandoned, which is a continuation-in-part of Ser. No. 532,391, Sep. 15, 1983, abandoned. This application Jul. 1, 1988, Ser. No. 217,146

Int. Cl.[5] H05K *1/00*

U.S. Cl. 361—398 **11 Claims**



1. A wafer scale package system, comprising:

a substantially rigid wafer based substrate which supports a plurality of integrated circuits, said substrate including a network of electrically conductive lines for selectively interconnecting said circuits together on said substrate, and a plurality of sites disposed generally around the periphery of said substrate for enabling external electrical connections to be made with at least some of said lines;

a substantially rigid circuit board; and

flexible header means disposed generally between the periphery of said substrate and said circuit board for providing a flexible interface between said substrate and said circuit board, said header means having a plurality of inner sites for facilitating selected electrical connections between said substrate and said header means, a plurality of outer sites for facilitating selected electrical connections between said header means and said circuit board, and an electrically conductive line extending between and joining corresponding pairs of said inner and outer sites, and said header means being formed to permit said substrate to move relative to said circuit board in response to relative thermal expansion and contraction of said substrate with respect to said circuit board, so as to permit said substrate to lift slightly from said circuit board in response to a predetermined change in temperature; and

wherein said header means has aperture means for permitting a linear lift of said substrate with respect to said circuit board.

4,920,455

RADIO FREQUENCY DEVICE CIRCUIT ARRANGEMENT

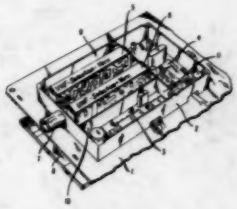
Gerhard Maier, Dauchingen, and Betram Fischer, Deisslingen, both of Fed. Rep. of Germany, assignors to Deutsche Thompson-Brandt GmbH, Villingen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 626,676, Jul. 2, 1984, abandoned. This application Dec. 19, 1988, Ser. No. 286,631

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1983, 8319031

Int. Cl.[5] H04B *1/08*; H05K *9/00*

U.S. Cl. 361—424 **31 Claims**



1. A radio frequency apparatus subassembly comprising

a single base circuit board having a side loaded with device components and having a soldering side;

device components employed in radio frequency circuits and integrated onto the side of the single base circuit board loaded with device components;

a rectangular box frame having box walls placed and attached onto the component side of the single base circuit board;

a separating wall disposed in the box frame and between box frame walls;

a first subcircuit module board attached between the single base circuit board, the separating wall, and one of the walls of the box frame, and disposed parallel to a second wall of the box frame, said second wall of the box frame forming a corner with the first wall of the box frame, and said second wall of the box frame maintaining the separating wall in position, where function elements of the first subcircuit module board are provided with device elements on the side of the first subcircuit module board facing the second wall of the box frame, and where the second side of the first subcircuit board module is substantially a soldering side;

a second subcircuit module board attached between the single base circuit board, the separating wall, and another of the walls of the box frame, and having a substantially soldering side facing the soldering side of the first subcircuit board module and loaded with components on its second side, wherein the first subcircuit board module and/or the second subcircuit board module comprise application-dependent selectable specific UHF and/or,

respectively, VHF selection and pre-stages, and wherein the respective subcircuit board modules further contain some variable component elements.

4,920,456

CURRENT SUPPLY ARRANGEMENT FOR HOUSEHOLD APPLIANCES AND METHOD OF MAKING THE SAME

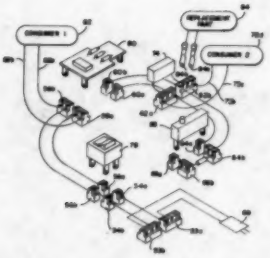
Rolf Pirdzuns, Wuppertal, Fed. Rep. of Germany, assignor to Vorwerk & Co. Interholding GmbH, Wuppertal, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 92,060, Sep. 2, 1987, abandoned. This application Sep. 19, 1988, Ser. No. 246,200

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1986, 3629853

Int. Cl.[5] H02B *1/20*

U.S. Cl. 361—428 **8 Claims**



5. A household appliance such as a floor-cleaning apparatus, the apparatus comprising:

a housing having an inside wall surface;

a plurality of electrical components;

a plurality of terminals blocks mounted on said wall surface and arranged in spaced relationship to each other;

each of said terminal blocks having a predetermined number of slotted cavities;

a plurality of wire segments obtained by laying down at least one uninterrupted wire interconnecting said slotted cavities and then cutting out a length of wire between at least one selected pair of said terminals;

each one of said wire segments being disposed in preselected ones of said cavities so as to provide an electrical connection between said preselected ones of said cavities;

a plurality of sets of interconnected cutting contacts;

each one of said sets being assigned to a selected number of cavities in each of a predetermined number of said terminal blocks and the cutting contacts of each set being seated in corresponding ones of the selected number of said cavities;

each of said wire segments being in electrical contact engagement with the electrical contact in the preselected cavity wherein a corresponding wire segment is disposed; and,

each of said electrical components being connected across two preselected ones of said cutting contacts.

4,920,457

ALUMINUM ELECTROLYTE CAPACITOR AND METHOD FOR THE MANUFACTURE THEREOF

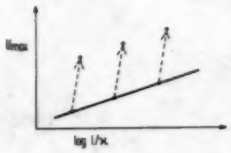
Wilhelm Schweikert, Heidenheim-Mergelst; Norbert Will, Heidenheim, and Wilhelm Lauer, Giengen-Huerben, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 1, 1988, Ser. No. 278,349

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1988, 3800641; Feb. 8, 1988, 3803768; Jun. 10, 1988, 3819850

Int. Cl.[5] H01G *9/00*

U.S. Cl. 361—530 **19 Claims**



1. An aluminum electrolyte capacitor that is composed of wound layers of two aluminum foils, whereof the foil serving as anode is provided with an oxide layer acting as dielectric, whereby this anode foil is produced by cutting from a larger, formed foil web, whereby spacers saturated with an operating electrolyte are arranged between the two aluminum foils and whereby the aluminum foils are contacted with riveted and/or welded power supply terminal strips, the terminal elements and cut edges of the aluminum foil arranged at the face sides of the winding are covered with a fine-grained, electrolyte-compatible material to reduce the effective cross-section of the electrolyte by the fine-grained material to increase the sparking voltage of the operating electrolyte and thus to achieve an inactivation of weak points.

4,920,458

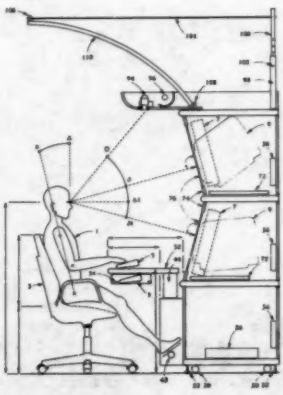
INTERACTIVE WORKSTATION

Benjamin P. Jones, P.O. Box 9342, Berkeley, Calif. 94708

Filed Jun. 29, 1989, Ser. No. 375,141

Int. Cl.[5] A61G *13/00*; F21V *13/00*

U.S. Cl. 362—33 **5 Claims**



1. An equipment housing comprising:

a base module having a substantially planar upper surface for providing a base foundation;

a worksurface module coupled to said base module and

having a substantially planar upper surface to accommodate a device for human interaction;

said worksurface module being adjustable to adjust the height of said upper surface for providing ergonomic positioning of said device for human interaction;

a first tier display housing module residing on said upper surface of said base module for housing a first display unit;

said first tier display housing module residing on said upper panel of said first tier display housing display comprised of a back, two sides, an upper and a front panels;

a second tier display housing module residing on said upper surface of said first tier display housing module for housing a second display unit;

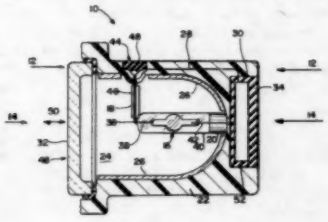
said second tier display housing module comprised of a back, two sides, an upper and a front panels, wherein said front panel of said first tier display housing module is angled approximately 15° upward from the vertical, away from an operator, and said front panel of said second tier display housing module is angled approximately 15° downward from the vertical, towards said operator.

4,920,459

ARC DISCHARGE HEADLAMP SYSTEM

Harold L. Rothwell, Jr., Georgetown, and George J. English, Reading, both of Mass., assignors to GTE Products Corporation, Danvers, Mass.

Filed Dec. 21, 1988, Ser. No. 287,925
Int. Cl.[5] B60Q *1/02*
U.S. Cl. 362—61 **19 Claims**



1. An arc discharge headlamp system comprising:

a) a lamp housing including an internal surface defining a reflector cavity,

b) a double ended arc discharge lamp having a first lead at a first end and a second lead at a second end, substantially offset from the first lead, enclosed in the reflector cavity,

c) a first lamp support coupled to the first end of the lamp, and coupled to the lamp housing,

d) a first lead connection for the first lead of the lamp coupled through the lamp housing at a first lamp housing position to receive input current,

e) a second lamp support coupled to the second end of the lamp, and coupled to the lamp housing,

f) a second lead connection for the second lead of the lamp, coupled through the lamp housing at a second lamp housing position and offset from the first lamp housing position; and

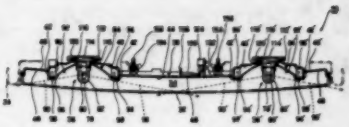
g) an insulated high potential conductor, connected to the second lead connection, embedded in the lamp housing, and extending in the lamp housing to a third housing position to receive input current.

4,920,460

SELF-ILLUMINATED GRILL FOR MOTOR VEHICLES

Hideshi Mori, Kitawaki, Japan, assignor to Koito Seisakusho Co., Ltd., Tokyo, Japan

Filed Apr. 12, 1989, Ser. No. 337,225
Claims priority, application Japan, Apr. 12, 1988, 63-90091
Int. Cl.[5] B60Q *1/02*
U.S. Cl. 362—61 **11 Claims**



1. A self-illuminated grill for a motor vehicle of the type having a pair of headlamps disposed in horizontally spaced apart positions on the front end of a vehicle body, comprising:

(a) an elongate grill body to be mounted to the vehicle body so as to be disposed horizontally between the pair of headlamps, the grill body being generally open forwardly of the motor vehicle;

(b) an elongate lens mounted to the open front side of the grill body and coacting therewith to define an enclosed lighting chamber; and

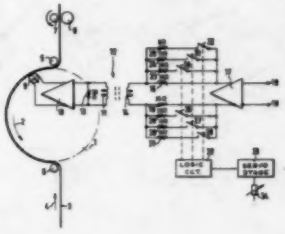
(c) said headlamps disposed in the lighting chamber for illuminating substantially the complete length of the lens.

4,920,461

BROADBAND MAGNETIC TAPE RECORDING WITH COMPENSATION FOR BANDWIDTH CHANGES RELATED TO DATA RATE

Berthold Eiberger, Darmstadt, Fed. Rep. of Germany, assignor to BTS Broadcast Television Systems GmbH, Darmstadt, Fed. Rep. of Germany

Filed Jan. 12, 1989, Ser. No. 296,521
Claims priority, application Fed. Rep. of Germany, Jan. 14, 1988, 3800827
Int. Cl.[5] G11B *5/02, 5/14*
U.S. Cl. 360—68 **4 Claims**



1. Method for transmitting signals from stationary circuits including a driver amplifier connected to a recording amplifier and a magnetic head on a rotary body of a magnetic recording device for broadband signals through a rotary transformer having a predetermined transmission frequency range, a first group of electrical components mounted on said rotary device being associated with said recording amplifier being connected to a rotor winding of said rotary transformer and a second group of electrical components being associated with said driver amplifier and being connected to the stator of said rotary transformer, comprising the steps of:

performing magnetic recording on said head and amplifier at a maximum relative speed of said recording head with respect to tape on which recording is performed with a

driver series resistance provided by said second electric component group for said driver amplifier and an input terminating resistance provided by said first electric component group for said recording amplifer which resistances provide at least an approximate impedance match across said rotary transformer, and

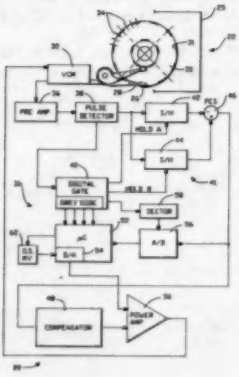
performing recording at lower relative speeds of said recording head with respect to tape on which recording is performed with changes of either said driver series resistance or said input terminating resistance or of both said driver series resistance and said input terminating resistance to produce a mismatch lowering the upper cut-off frequency of the transmission band of said rotary transformer for the benefit of lowering the lower cut-off frequency thereof.

4,920,462

DISC DRIVE FINE SERVO VELOCITY CONTROL AND METHOD FOR HEAD POSITIONING RELATIVE TO A DISC

Robert F. Couse, Saratoga, and Patrick G. Mercer, Santa Clara, both of Calif., assignors to Syquest Technology, Fremont, Calif.

Filed Mar. 7, 1988, Ser. No. 164,881
Int. Cl.[5] G11B *5/55, 21/08, 21/10*
U.S. Cl. 360—78.04 **16 Claims**



10. A method for causing a data transfer head to seek and settle onto a destination data track in a quick and smooth manner including the steps of:

providing a servo velocity control for seeking to a destination data track;

providing a servo position control for locating a centerline of a destination data track and for centering the head about on the centerline;

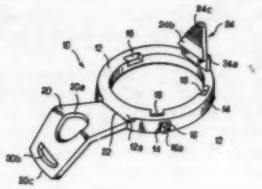
providing a fine servo velocity control for the communication of centerline centering information from the servo position control to the servo velocity control, to assist in track seeking, as the destination data track is approached and reached by the head, beginning when the servo velocity control determines the head is a preselected distance from the destination data track.

4,920,463

LAMPHOLDER FOR AN AUTOMOBILE VEHICLE HEADLIGHT

Maurice Montet, Paris, France, assignor to Valeo Vision, Bobigny Cedex, France

Filed Jul. 14, 1989, Ser. No. 380,546
Claims priority, application France, Jul. 20, 1988, 88 09815
Int. Cl.[5] H01R *33/00*
U.S. Cl. 362—61 **9 Claims**



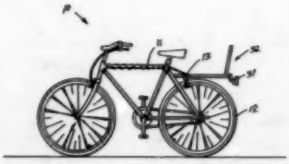
1. A lampholder for mounting a lamp in an opening of a reflector for an automotive vehicle headlight, the lampholder comprising a ring, mounting means for mounting said ring in the opening of the reflector, said ring defining locating means for locating a lamp on said ring in a position predetermined both axially and circumferentially, and securing means for securing the lamp removably in said ring in said location, said securing means comprising a radially extending tongue and a locking finger for said tongue, diametrically opposed to each other and formed integrally with said ring, said tongue being hinged on said ring and having a longitudinal profile such that, when it is moved into a position diametrically overlying said ring, it covers a portion of the lamp, said tongue further comprising means for engaging said locking finger to thereby retain said tongue removably in said position, said tongue being resiliently deformable to thereby, when thus retained in said position, hold the lamp firmly in position by virtue of a biassing force resulting from deformation of said tongue.

4,920,464

BICYCLE BRAKE LIGHT

Alfred Balentine, III, 1616 Kemble, N. Chicago, Ill. 60064

Filed Aug. 7, 1989, Ser. No. 390,977
Int. Cl.[5] B62J *6/00*
U.S. Cl. 362—72 **9 Claims**



1. A bicycle brake light apparatus in combination with a bicycle including a bicycle framework having secured thereto a plurality of spaced wheels with at least one brake caliper member in operative association with at least one of said wheels, the caliper member including first and second spaced brake engagement members secured to forward ends of pivotally arranged first and second caliper arms, and the first caliper arm including a switch member,

wherein the switch member includes first and second contact members, and the switch member is fixedly mounted on a rear terminal end of the first caliper arm, and

a brake cable fixedly mounted to a rear terminal end of the

second caliper arm and reciprocatably received to the switch member, and

a light means in electrical communication with the switch member for illumination upon physical contact of the first contact with the second contact within the switch member, and

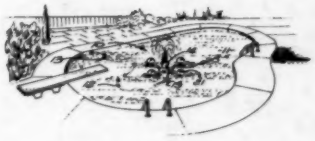
a battery in electrical communication with the switch member and the light means.

4,920,465

FLOATING FOUNTAIN DEVICE

Ronald J. Sargent, Escondido, Calif., assignor to Alopex Industries, Inc., San Marcos, Calif.

Filed Nov. 15, 1988, Ser. No. 271,735
Int. Cl.[5] F21V *33/00*
U.S. Cl. 362—96 **7 Claims**



1. A floating fountain device for use in a swimming pool comprising:

a central housing having a plurality of hollow, radially projecting arms thereon each having a pod-like float on its outer end, said housing and said arms being buoyant to float the device on the surface of a pool, and one of said floats having a separate bottom wall sealed to the underside of the float;

means defining an inlet for admitting water under pressure into a lower end of said housing and an outlet for water to flow out of the upper end of the housing;

a fountainhead connected to the central housing for receiving flowing pressurized water that passes through the housing and ejecting the water from the housing to form a fountain of water;

an electric lamp mounted in said one float on said bottom wall thereof, and positioned to direct a beam of light into the fountain of water;

a waterproof sealed envelope in said housing supported in spaced relation with the housing to form flow passages from the inlet toward the outlet;

an electricity generator sealed in said envelope and having wires for electrically connecting the generator to said lamp through one of said arms;

a water turbine mounted in said housing above said envelope and having inlet openings for receiving water under pressure from said flow passages and forming driving jets for the turbine, said turbine being positioned beneath said outlet to deliver the water from the turbine to the fountainhead;

and a magnetic coupling having a first coupling half carried by said turbine and a second coupling half spaced beneath said turbine within said envelope and coupled to said generator to drive the generator and thereby provide electricity to said lamp.

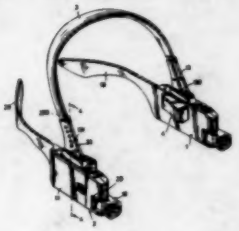
4,920,466

HEADPHONE TYPE ILLUMINATING DEVICE WITH MASSAGE

Ju-Fu Liu, No. 298, Tung Ta Rd., Sec. 3, Hsin Tzu City, Taiwan

Filed Jun. 30, 1989, Ser. No. 373,434
Int. Cl.[5] F21L *15/14*
U.S. Cl. 362—105 **5 Claims**

1. A headphone type illuminating device with massage means including a pair of spectacle frame-like supporting members to which a pair of lamp cases and a pair of illuminating devices are secured; a pair of supporting arms disposed at the top of said lamp cases and arranged to extend upward in an inclined angle; an auxiliary loop adjustably connected to said pair of supporting arms with both ends; a pair of vibrators and the related power supply means, each power supply means



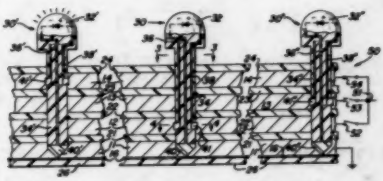
being set in an inner chamber of said lamp cases; a pair of hollow cushion blocks secured to said supporting members at the inner side; wherein said power supply means provide said vibrators with working power of vibrate said cushion blocks to produce massaging effect while said illuminating devices are simultaneously or separately arranged to provide illumination.

4,920,467

CONTROLLED STRATIFIED RANDOM AREA ILLUMINATOR

Calvin P. Honsberger, 1275 Grange Ave., Collegeville, Pa. 19426

Filed May 5, 1988, Ser. No. 190,331
Int. Cl.[5] G09F *3/04*
U.S. Cl. 362—226 **11 Claims**



1. A random area illuminator comprising:

a base including a plurality of conductive layers and a plurality of insulating layers, said conductive and insulating layers being arranged in alternating layers,

a plurality of illuminating means adapted to be mounted on said base in an illuminating array,

each of said illuminating means having a light source and a post having said light source at one end thereof,

each of said posts comprising first and second insulated electrical leads for supplying electric current to said light source mounted thereon,

each of said posts being adapted to extend from the outer layer of said base to a common conductive layer of said base,

said first lead of each post having an electrical contact arranged to provide electrical connection to said common conductive layer,

said second lead of each post having an electrical contact arranged to provide electrical connection to another one of said conductive layers, and

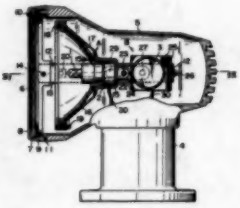
control means for supplying electric current to selected ones of said otherconductive layers.

4,920,468

MECHANISM FOR MOUNTING A LIGHT SOURCE AND A LAMP TILTING SECTION OF A SEARCHLIGHT

Yuichi Narita, Urawa, Japan, assignor to Sanshin Dengu Manufacturing Co., Ltd., Japan

Filed Feb. 2, 1989, Ser. No. 305,934
Claims priority, application Japan, Feb. 9, 1988, 63-15215[U]
Int. Cl.[5] F21V 19/02
U.S. Cl. 362—287 3 Claims



1. A mechanism for mounting a light source which in turn includes a lamp, a reflector and a socket, and a lamp tilting section for swinging the light source vertically, within a housing of a searchlight including the light source and the lamp tilting section, comprising:

means slidingly insertable within the housing for supporting the light source and the tilting section, said supporting means including a substantially U-like support frame, the light source being supported swingably across the branches of the U-like support frame, and the lamp tilting section is fixed to a connection portion of the support frame which connects both the branches;

means formed in the inner surface of the housing for guiding the supporting means; and

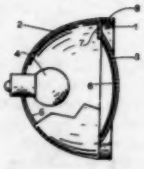
means for fixing the supporting means removably to a front opening end of the housing.

4,920,469

LIGHT BEAM AMPLIFIER

David K. Harding, c/o Sixpence Inn, 625 Queen St., Southington, Conn. 06489

Filed Nov. 2, 1988, Ser. No. 265,940
Int. Cl.[5] F21V 7/06
U.S. Cl. 362—300 5 Claims



1. A light beam amplifier comprising:

a light source;

a generally paraboloidal primary reflector having a vertex at the light source and an opening at a base at the opposite side of the light source;

a generally paraboloidal light-concentration reflector having a diameter selectively smaller than the primary reflector and permanently affixed at the base from the light source and positioned to reflect light and heat back toward the primary reflector and the light source; and

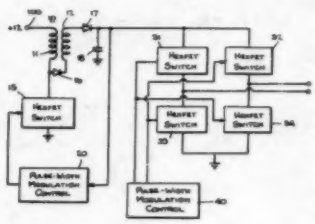
an annular light emission orifice adjacent to and extending between the outside periphery of the light-concentration reflector and the inside periphery of the primary light reflector, wherein the ratio of the light-concentration reflector to the orifice is such that the light emitted through the orifice is amplified and converges at some point of distance in front of the orifice.

4,920,470

VOLTAGE INVERTER

Philip E. Clements, Littleton, Colo., assignor to Zirco, Inc., Wheat Ridge, Colo.

Filed May 17, 1989, Ser. No. 352,860
Int. Cl.[5] H02M 3/335
U.S. Cl. 363—21 8 Claims



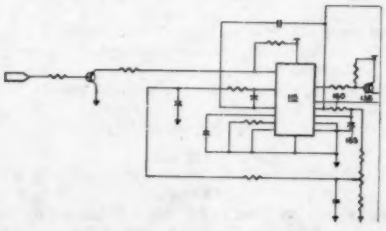
1. An inverter circuit comprising a transformer having a primary winding with a first end adapted to be connected to a d.c. source, a switch connecting the other end of said primary winding to a reference potential, a secondary winding coupled to said primary winding, means for rectifying the output of said secondary winding, and a bridge switch circuit connected to invert the rectified secondary winding voltage to produce an a.c output voltage, said inverter circuit further comprising a first control circuit for producing a first pulse train of pulses having a first given frequency and a pulse width responsive to the rectified output voltage of said secondary winding, and means for applying said pulse train to said switch for controlling said switch to open and close at said given frequency, said inverter circuit further comprising a second control circuit for producing a second pulse train of pulses of a second given frequency and constant pulse width, and means controlling said bridge switch circuit with said second pulse train of pulses.

4,920,471

AC HIGH VOLTAGE POWER SUPPLY

Robert N. Livingston, Johnson City, and Michael Kosteva, Endwell, both of N.Y., assignors to Imagitek, Binghamton, N.Y.

Filed Mar. 11, 1988, Ser. No. 167,031
Int. Cl.[5] H02M 3/335
U.S. Cl. 363—22 8 Claims



1. A high voltage AC power supply for use in a reproduction machine, comprising:

a transformer having a high turns winding ratio, including a primary side having a low voltage winding, said primary

side including means for sampling voltage proportional to secondary side voltage in said power supply;

said transformer having a high voltage secondary winding including means for sampling a load current through said winding;

comparing means adapted to receive and compare said voltage from said current sampling means with a reference voltage and to generate an error signal;

a buck regulator adapted to receive said error signal from said comparator, said buck regulator including means to convert said error signal into a variable DC voltage signal;

an oscillator adapted to receive said variable DC voltage signal from said buck regulator, said oscillator including overvoltage protection means for said power supply; and

inductive means for limiting current surge of said variable DC voltage signal to said overvoltage protection means.

4,920,472

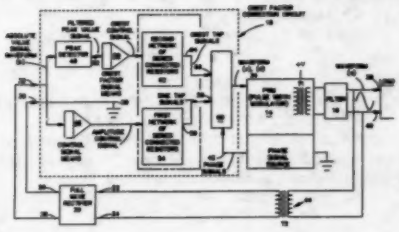
CREST FACTOR CORRECTION CIRCUIT

Howard Handler, Westminster, Calif., assignor to Deltec Electronics Corporation, San Diego, Calif.

Filed May 31, 1989, Ser. No. 359,356

Int. Cl.[5] H02M 7/44

U.S. Cl. 363—95 **13 Claims**



1. A control circuit for providing a composite control signal to a control input of an ac inverter, said ac inverter providing an ac output from a dc power source, said control circuit comprising:

A. first means, receiving said ac output of said ac inverter, for generating an amplitude control signal based on one of an average or RMS value of said ac output;

B. second means, receiving said ac output of said ac inverter, for generating a crest control signal for controlling the amplitude of the peak value of said ac output; and

C. means, connected to said first and second means and to said control input of said ac inverter, for feeding said amplitude control signal and said crest control signal to said control input of said ac inverter as said composite control signal.

4,920,473

METHOD AND ARRANGEMENT TO COMMUTATE THE CURRENT BETWEEN TURN-OFF VALVE ARMS OF AN I-TYPE STATIC CONVERTER

Wolfgang Frankenberg, Erlangen; Hans Laber, Erlangen-Bruck, and Alois Weschta, Buckenhof, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 14, 1989, Ser. No. 310,728

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1988, 3804808

Int. Cl.[5] H02M 7/521

U.S. Cl. 363—96 **11 Claims**

7. A static converter device for a load-independent current, comprising:

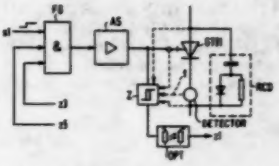
a plurality of valve arms, wherein each valve arm includes:

a valve device with current blocking ability in a reverse direction and having a control input;

a valve damping circuit coupled to said valve device;

a control circuit coupled to said valve device which generates a turn off signal to turn off the valve device and an actuation signal to switch on the valve device;

a status acquisition device coupled to the valve device



which detects a zero current level of the valve device and generates a status signal indicating the zero current level of the valve device;

an unblocking device coupled to the control circuit which enables the control circuit to supply the actuation signal to the valve device in the valve arm in response to the generation of the status signal in another of said valve after the another valve arm has been turned off.

4,920,474

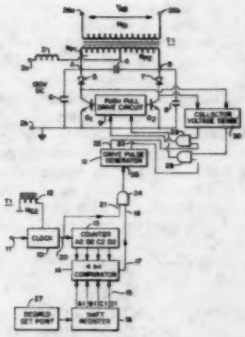
HIGH FREQUENCY HIGH VOLTAGE POWER SUPPLY WITH CONTROLLED OUTPUT POWER

Gert W. Bruning, Tuckahoe, and Edward H. Stupp, Spring Valley, both of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Continuation of Ser. No. 328,377, Mar. 23, 1989, Pat. No. 4,882,666. This application Aug. 29, 1989, Ser. No. 400,181

Int. Cl.[5] H02M 7/537

U.S. Cl. 363—97 **3 Claims**



1. A high frequency high voltage oscillator circuit with controlled output power comprising:

a resonant LC tank circuit coupled to a source of DC supply voltage and to at least one controlled semiconductor switching device,

a drive circuit coupled to a control electrode of said semiconductor switching device for supplying drive pulses thereto, and

a control circuit coupled to said drive circuit so as to periodically disable the supply of drive pulses from the drive circuit to the control electrode of the semiconductor switching device as a function of the desired output power of the oscillator circuit whereby a self-oscillation voltage

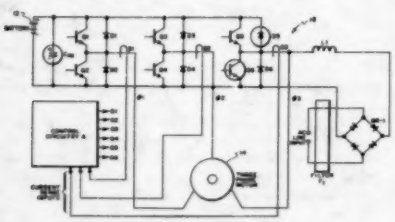
of decreasing amplitude is generated by said oscillator circuit, said control circuit being operative to periodically enable the supply of said drive pulses from the drive circuit to the control electrode of the semiconductor switching device before the self-oscillation voltage decays to a zero voltage level.

4,920,475

INTEGRATED TRACTION INVERTER AND BATTERY CHARGER APPARATUS

Wally E. Rippel, Altadena, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Mar. 7, 1988, Ser. No. 164,868
Int. Cl.[5] H02M 7/537
U.S. Cl. 363—132 **7 Claims**



1. An integrated inverter/charger apparatus, comprising:
a polyphase bridge inverter adapted to be connected to a polyphase load said inverter including a plurality of switch elements and current path blocking elements;
an input capacitor, said capacitor and inverter adapted to be connected in parallel across a DC source;
a rectifier having an input and an output connected at its input to an AC input line;
inductor means connected between said inverter and said output of the rectifier; and
control circuitry coupled to said inverter and being adapted to control the invertor in either a drive mode wherein, with the AC input line being disconnected from said input of the rectifier and with said inverter being connected to the polyphase load, said inverter is rendered active by said control circuitry so as to be operated by the DC source to drive the polyphase load or a charge mode wherein, with the AC input line being connected to said input of the rectifier and with said inverter remaining connected to the polyphase load, only a portion of said inverter is rendered active by said control circuitry so as to connect the DC source and input capacitor with said inductor means and rectifier and to be operated by the AC input line to charge the DC source.

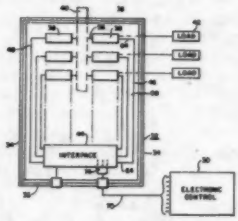
4,920,476

ELECTRONIC CONTROL FOR LIGHTING PANELBOARDS

Bruce L. Brodsky, South Fayette Twp., Allegheny County; David L. Davidson, New Alexandria; Dwight L. Hutton, Monroeville; William L. Vasiladiotis, Bell Acres, and Mark D. White, South Park Twp., Allegheny County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 27, 1988, Ser. No. 199,488
Int. Cl.[5] H02H 3/08
U.S. Cl. 364—140 **7 Claims**

1. In an integrated building electrical load management system, the combination of, a power line panelboard having a plurality of circuit breakers for controlling electrical loads;
printed circuit board means having a plurality of conductor connections and of breaker connections;
electronic control means for providing electronic control and diagnostics for the circuit board means and having a plurality of conductors leading to the conductor connections; and
each circuit breaker including a remotely controlled solenoid for mechanically actuating the circuit breaker for opening and closing a circuit through a load and which solenoid includes control wires connected to selected



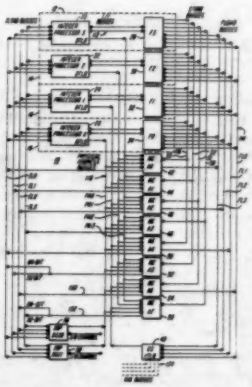
breaker connections, said circuit breaker as thusly configured operating as a controlled switch in addition to providing a circuit protective function;
whereby the printed circuit board means functions as a circuit breaker interface between the separate circuit breakers and the electronic control means.

4,920,477

VIRTUAL ADDRESS TABLE LOOK ASIDE BUFFER MISS RECOVERY METHOD AND APPARATUS

Robert P. Colwell; John O'Donnell; David B. Papworth, all of Guilford, and Paul K. Rodman, Madison, all of Conn., assignors to Multiflow Computer, Inc., Branford, Conn.

Filed Apr. 20, 1987, Ser. No. 40,990
Int. Cl.[5] G06F 12/08, 9/38, 11/00
U.S. Cl. 364—200 **6 Claims**



1. In a data processor having
a central processing unit, and
at least one pipelined memory controller circuitry responsive to the central processing unit and having a memory pipeline, said central processing unit addressing data using a virtual address memory table look aside buffer, miss recovery circuitry comprising
a virtual address first in-first out buffer means for storing virtual address data from the central processing unit during at least each memory access instruction,
an instruction status first in-first out buffer means for storing

instruction status data generated in the memory circuitry during at least each memory access instruction,

means for detecting a memory access error condition during execution of a memory access instruction in the memory circuitry, and

a resequencing means having

means responsive to detection of the memory access error condition for at least correcting said memory access error condition, and

means for replaying, in sequence, after said error is corrected, the instruction causing the error condition and those instructions entering and in the memory pipeline after the instruction causing the error condition, said replaying means being responsive to the virtual address and instruction status first in-first out buffer means for replaying said instructions.

4,920,478

CACHE SYSTEM USED IN A MAGNETIC DISK CONTROLLER ADOPTING AN LRU SYSTEM

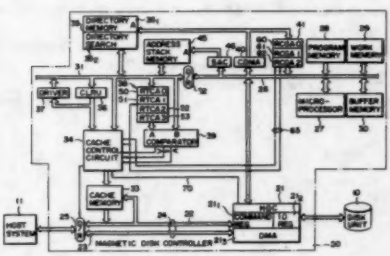
Akihiko Furuya; Kouiti Kanamaru, and Junichi Inoue, all of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki and Toshiba Computer Engineering Corporation, Tokyo, both of, Japan

Division of Ser. No. 867,449, May 28, 1986, Pat. No. 4,835,686. This application Mar. 24, 1989, Ser. No. 329,019

Claims priority, application Japan, May 29, 1985, 60-115918; Jun. 19, 1985, 60-133432; Aug. 29, 1985, 60-190308; Feb. 27, 1986, 61-42258

Int. Cl.[5] G06F 12/12

U.S. Cl. 364—200 **3 Claims**



1. A magnetic disk controller incorporating a cache memory, comprising:

determining means for determining if data requested on the basis of a disk access request from a host system is stored in said cache memory;

cache operation designation data storage means for storing cache operation designation data consisting of a cache memory address, the number of transfer sectors, a data transfer direction, and data representing necessity or lack of necessity of data transfer to said host system;

sector number reading means for reading a sector number stored in an ID field of a current read sector when a read miss is determined by said determining means upon a disk access request from said host system;

cache operation designation data producing means for producing the cache operation designation data on the basis of contents of the disk access request from said host system and a determination result from said determining means, and for storing the cache operation designation data in said cache operation designation data storage means, said cache operation designation data producing means, in the case of a read miss, to produce the cache operation designation data for each one of a plurality of subunits of a cache block to be replaced according to a cache memory address corresponding to a sector adjacent to the sector whose number is ready by said sector number reading means, a cache address corresponding to a start sector of a disk area from which data is to be transferred to said host system, and a cache memory address corresponding to a last sector from which data is to be transferred to said host system; and to sequentially store the cache operation designation data corresponding to the subunits of said cache block in said cache operation designation data storage means, the cache operation designation data including, a cache memory address corresponding to the sector adjacent to the sector whose number is read by said reading means, said cache memory address serving as start cache operation designation data; and

data transfer means for reading out the cache operation designation data from said cache operation designation data storage means in an order starting from the start cache operation designation data, and for performing data transfer operation on the basis of the readout data.

4,920,479

MULTIPROCESSOR SYSTEM WITH STORAGE CONTROL UNITS INCLUDING BUFFER STORAGE UNITS COMPRISING AN ERROR RECOVERY SYSTEM FOR STORAGE CONTROL UNITS

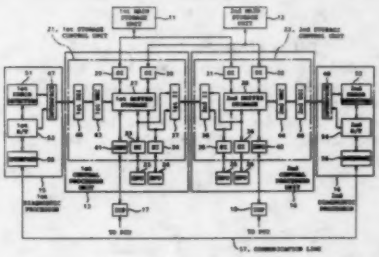
Tatsuro Hashiguchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 26, 1988, Ser. No. 160,757

Claims priority, application Japan, Feb. 28, 1987, 62-44079

Int. Cl.[5] G06F 11/16

U.S. Cl. 364—200 **6 Claims**



1. In an error recovery system for used in a multiprocessor system comprising a first and a second main storage means for storing first and second data each including programs, respectively, a first and a second storage control means coupled to said first and said second main storage means, respectively, said first and second storage control means comprising a first and a second buffer storage means of a store-in type operatively coupled to a particular one of said first and said second main storage means and a remaining one of said first and said second main storage means, respectively, said first and said second buffer storage means storing, as first and second buffer data, blocks of data read out from said particular one and said remaining one of said first and said second main storage means, respectively, and a plurality of execution processor means coupled to said first and said second storage control means for executing programs in said first and said second buffer storage means, said first and said second storage control means controlling data transfer between said particular one of said first and said second main storage means and said first buffer storage means and between said remaining one of said first and said second main storage means and said second buffer storage means, respectively, said first and said second storage control means further controlling data transfer between said first buffer storage means and said execution processor means and between said second buffer storage means and said execution

processor means, respectively, the improvement which comprises:

error detection means coupled with said first storage control means for detecting an error caused at any portion in said first storage control means during a period when a particular one of said plurality of execution processor means executes, as a current program, a program in said first buffer data, said error detection means producing a reading signal when confirming that said first buffer storage means is normal on detection of said error;

reading means responsive to said reading signal for reading out said first buffer data from said first buffer storage means to deliver said first buffer data as read-out data;

transmitting means coupled to said reading means for transmitting said read-out data;

receiving means coupled to said transmitting means for receiving said read-out data through said transmitting means to produce said read-out data as write-in data;

signal producing means coupled with said receiving means for producing a storing signal when said receiving means receives said write-in data; and

writing means responsive to said storing signal writing and write-in data in said second buffer storage means to thereby enable said particular execution processor means to restart the execution of said current program by use of said write-in data stored in said second buffer storage means;

said second storage control means responsive to said storing signal for transferring said second buffer data into said remaining one of said first and said second main storage means prior to writing of said write-in data into said second buffer storage means by said writing means.

4,920,480

DIGITAL SIGNAL PROCESSOR

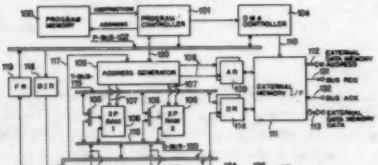
Tokumichi Murakami; Koh Kamizawa, and Masutoshi Kameyama, all of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 4, 1988, Ser. No. 164,257

Claims priority, application Japan, Mar. 5, 1987, 62-50755

Int. Cl.[5] G06F *13/14*

U.S. Cl. 364—200 **5 Claims**



1. A digital signal processor comprising:

a bus structure including a program bus for instruction transfer, a data bus only for internal data transfer and a data input/output bus only for data input and output;

a program memory which is separated from data memories for storing a certain program;

a program controller connected to said program memory and to said program bus for reading out said program from said program memory and for executing instruction transfer, internal operation and data input/output in parallel fashion;

an internal data memory comprising a plurality of 2-port memories, connected selectively to said data bus and said data input/output bus, and adapted to store data in block units;

an arithmetic operator connected selectively to said data bus and said internal memory for executing internal operations including binomial operations;

a direct memory access (DMA) controller connected to said program controller and to said program bus and connecting said internal data memory with an external data memory through said data input/output bus to implement DMA transfer for block data in parallel to said internal operation;

an address generator which generates an address of said internal data memory for internal operation by said arithmetic operator and an address of said external data memory for DMA transfer by said DMA controller concurrently and in parallel to said internal operation, said address generator being connected to said program bus, said data bus and said internal data memory; and

parallel data input/output interface means which include a first-in first-out (FIFO) memory and which connect an external device to said data bus and said FIFO memory to implement parallel data communication with said external device independently of input/output operations and in asynchronous fashion.

4,920,481

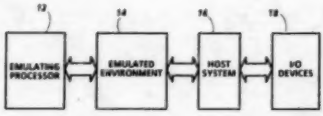
EMULATION WITH DISPLAY UPDATE TRAPPING

Joseph H. Binkley; Perry A. Caro; John B. Dillon, all of Palo Alto; Charles R. Fay, Long Beach; Jonathan Gibbons, Mountain View; Hilary N. Hooks, Newark; Abdo G. Kadifa; Jeffery W. Lee, both of Palo Alto; William C. Lynch, Palo Alto; Clayton W. Mock, Redwood City; Everett T. Neely, Montara; Michael L. Tallan, Mountain View; Geoffrey O. Thompson, Palo Alto; Gaya Vukkadala, Sunnyvale; John D. Wick, Palo Alto, and Donald R. Woods, Los Altos, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 856,526, Apr. 28, 1986. This application Dec. 8, 1987, Ser. No. 130,369

Int. Cl.[5] G06F *15/16, 3/153*

U.S. Cl. 364—200 **15 Claims**



1. A system for emulating a target system having a central processor for executing a set of target system instructions and a display memory for storing image data defining an image to be displayed, the emulating system comprising:

a host system having a host processor for executing a set of host system instructions different from the target system instructions; the host system further comprising display means for providing a display; and

an emulating processor for executing a sequence of the target system instructions; the emulating processor providing signals during execution of the sequence of target system instructions, one of the signals being a display update signal indicating an update of the image data in the display memory of the target system; the display update signal being a memory access signal requesting access to a location in the display memory of the target system, the display update signal including a memory address;

the host system further comprising a host memory that includes a display memory region for storing the image data, the display memory region comprising a respective location for the location in the display memory of the target system; the image data at the respective location in

the display memory region being accessed and updated in response to the display update signal;

the host system further comprising environment means for providing an environment for the emulating processor so that the emulating processor continues to execute the sequence of target system instructions; the environment means comprising display update monitoring circuitry connected for detecting when the emulating processor provides the display update signal and for obtaining display update monitoring data relating to the image data update indicated by the display update signal;

the host processor independently executing a sequence of the host system instructions while the emulating processor executes the sequence of target system instructions; the host processor being connected for receiving the display update monitoring data and for controlling the display means; the host processor, in executing the sequence of host system instructions, operating to cause the display means to provide the display in accordance with the display update monitoring data.

4,920,482

MULTIPLE MODE MICROPROGRAM CONTROLLER

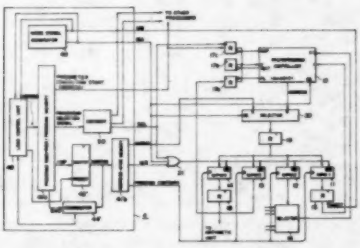
Atsushi Hasebe, Kangawa, Japan, and Ryohei Kato, College Park, Md., assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 19, 1986, Ser. No. 932,277

Claims priority, application Japan, Nov. 19, 1985, 60-259543

Int. Cl.[5] G06F *9/24, 9/26*

U.S. Cl. 364—200 **7 Claims**



1. An information processing apparatus comprising:

a program supplying portion;

write signal generator means; and

a data processor including a microprogram controller, microprogram memory, arithmetic unit, and selector means for selecting an address from said microprogram controller and an address from said program supplying portion and supplying the selected address to said microprogram memory; and

a manually actuatable mode signal generator for generating mode signals to effectuate a plurality of modes selected by the user of the apparatus, wherein

in response to a first mode signal, said selector means supplies an address from said microprogram controller to said microprogram memory and a program is thereby executed,

in response to a second mode signal, said selector means supplies an address from said microprogram controller to said microprogram memory and said microprogram controller is caused to generate program start addresses, and

in response to a third mode signal, said selector means supplies an address from said program supplying portion to said microprogram memory and in response to a write signal from said write signal generator means fed to said program supplying portion, the program from said program supplying portion is written in the microprogram memory.

4,920,483

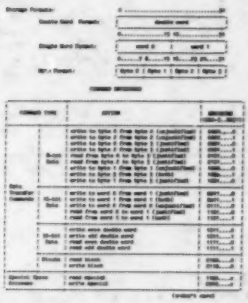
A COMPUTER MEMORY FOR ACCESSING ANY WORD-SIZED GROUP OF CONTIGUOUS BITS

Michael A. Pogue; Morgan J. Dempsey, both of Framingham; Shreyaunsh R. Shah, Milford, and Leo C. Wahle, III, Northboro, all of Mass., assignors to Data General Corporation, Westboro, Mass.

Filed Nov. 15, 1985, Ser. No. 798,665

Int. Cl.[5] G06F *12/04*

U.S. Cl. 364—200 **6 Claims**



1. A method of operating a memory in a digital data system,

the memory being used for addressably storing and retrieving any of a plurality of n-bit words,

the memory comprising a plurality of storage chips organized such that:

(a) each storage chip stores bits associated with only one bit position of the n-bit words; and

(b) each combination of address bits elicits a single bit from each of n storage chips, each containing a different bit position of the n-bit word,

the digital data system including means for decrementing addresses by one;

the method of comprising the steps of:

(a) determining for each memory access an n-bit number "m" denoting a bit position offset within a n-bit word of the rightmost bit of a desired group of n contiguous bits;

(b) using, for all chips storing bits of bit position equal to or less than m, the undecremented address; and

(c) using, for all chips storing bits of bit position greater than m, the decremented address,

whereby any n contiguous bits may be accessed.

4,920,484

MULTIPROCESSOR/MEMORY INTERCONNECTION NETWORK WHEREIN MESSAGES SENT THROUGH THE NETWORK TO THE SAME MEMORY ARE COMBINED

Abhiram G. Ranade, Berkeley, Calif., assignor to Yale University, New Haven, Conn.

Filed Oct. 5, 1988, Ser. No. 253,961

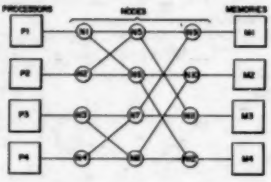
Int. Cl.[5] G06R *13/00*; H04Q *11/04*

U.S. Cl. 364—200 **16 Claims**

1. A method for enabling efficient communication in a network between a plurality of target address modules and a plurality of source address generators, said source address generators able to generate target addresses contained within said target address modules, said network including a plurality of interconnected nodes, each node having M inputs and N outputs where M and N are positive integers and M is equal to or greater than 2, each node having queue means coupled to each said input, each said queue means for storing data in a first-in first-out manner, the first-in data in said queue being at a head of said queue, and means for carrying out a communication protocol, said method comprising the steps of:

placing target addresses from messages received on each said node input into a queue means;

examining the target addresses at heads of at least two said queue means; and



transmitting from a node, only when at least two target addresses are present in different queue means, one said message whose target address is found to bear a predetermined relationship to a target address of another said message contained at the head of another said queue means.

4,920,485

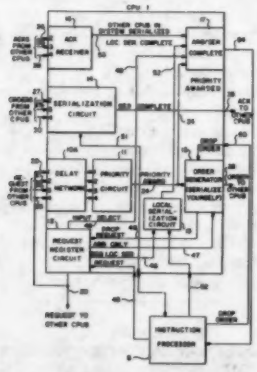
METHOD AND APPARATUS FOR ARBITRATION AND SERIALIZATION IN A MULTIPROCESSOR SYSTEM

Ali Vahidsafa, Tokyo, Japan, assignor to Amdahl Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 902,497, Sep. 2, 1986, abandoned. This application Aug. 31, 1988, Ser. No. 239,067

Int. Cl.[5] G06F *13/14*

U.S. Cl. 364—200 **9 Claims**



1. A distributed multiprocessor system comprising:

a plurality of distributed central processing units (CPUs) for processing data in response to instructions, wherein each given CPU in said plurality of distributed CPUs comprises:

means, responsive to a predetermined instruction in said given CPU, for generating a REQUEST TO SERIALIZE OTHER CPUs signal (REQUEST);

means, connected to the REQUEST generating means in said given CPU, for transmitting a REQUEST generated by said REQUEST generating means in said given CPU to all of said plurality of distributed CPUs;

means, coupled to said REQUEST transmitting means in said plurality of distributed CPUs and having a plurality of outputs, for simultaneously supplying at said outputs all REQUESTs simultaneously generated by CPUs in said plurality of distributed CPUs, including

a plurality of inputs for receiving REQUESTS from all CPUs in said system; and

a delay circuit means for providing in series with each of said plurality of inputs a predetermined delay having a magnitude which is inversely proportional to an amount of time it takes to transmit a REQUEST from a sending CPU to one of said plurality of inputs; and

means, connected to receive REQUESTs from said plurality of outputs and responsive to simultaneously received REQUESTs, for awarding priority to one REQUEST from a single CPU of said simultaneously received REQUESTs for processing by said given CPU.

4,920,486

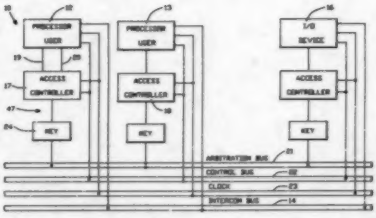
DISTRIBUTED ARBITRATION APPARATUS AND METHOD FOR SHARED BUS

Michael J. K. Nielsen, Palo Alto, Calif., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Nov. 23, 1987, Ser. No. 123,382

Int. Cl.[5] G06F *15/16*

U.S. Cl. 364—200 **11 Claims**



1. In a computer system having a multiplicity of subunits connected to a shared bus, distributed bus arbitration apparatus comprising:

an arbitration bus with means for carrying a multiplicity of substantially simultaneous bus request signals; and

a multiplicity of arbitration means, each coupled to the shared bus, the arbitration bus and a corresponding one of the subunits, for determining the relative priorities by which said subunits shall access said shared bus; each said arbitration means determining only whether said subunit coupled to said arbitration means is to be granted access to said shared bus;

each said arbitration means including:

status means for storing status signals denoting which ones of said subunits have higher priority and which ones have lower priority than the subunit corresponding to said arbitration means;

bus requesting means coupled to said arbitration bus for asserting a bus request signal on said arbitration bus; and

access control means, coupled to said arbitration bus and said status means, for receiving bus request signals asserted on said arbitration bus and for granting said corresponding subunit access to said shared bus only when said bus requesting means has asserted a bus request signal and none of the received bus request signals were asserted by the arbitration means of subunits denoted by said status means as having higher priority than said corresponding subunit;

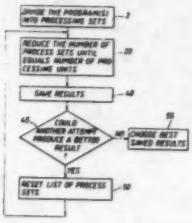
wherein said multiplicity of arbitration means simultaneously arbitrate access to the shared bus.

4,920,487

METHOD OF UP-FRONT LOAD BALANCING FOR LOCAL MEMORY PARALLEL PROCESSORS

Paul T. Baffes, Houston, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 12, 1988, Ser. No. 283,106
Int. Cl.[5] G06F 9/46, 15/16
U.S. Cl. 364—300 8 Claims


DIVIDE THE PROGRAM(S) INTO PROCESSING SETS
REDUCE THE NUMBER OF PROCESS SETS UNTIL EQUALS NUMBER OF PROCESSING UNITS
SAVE RESULTS
COULD ANOTHER ATTEMPT PRODUCE A BETTER RESULT ?
NO
CHOOSE BEST SAVED RESULTS
YES
RESET LIST OF PROCESS SETS

1. In a parallel processing computer system including a plurality of processing units and shared memory, and containing a network having identical computations to be executed at each connection therein, and said network further having a constant aggregate computational load, a method of up-front, load balancing comprising

generating a first signal representative of said plurality of processing units in said network,

generating a first plurality of signals with each such signal representing a corresponding one of said identical computations in said network,

generating in response to said first signal and said first plurality of signals a second signal representing a balance load in said network,

generating a second plurality of signals functionally establishing a preselected plurality of partitions of said memory,

generating in response to said first and second pluralities of signals, a first sequence of signals functionally dividing said computational load into a plurality of process sets,

generating in response to said second signal and said first sequence of signals, a second sequence of signals functionally allocating said process sets among said memory partitions, and

generating in response to said second sequence of signals, a third sequence of signals functionally merging said process sets until they are equal in number to said plurality of processing units.

4,920,488

PHYSICAL INVENTORY SYSTEM

Oliver D. Filley, 440 Holland Rd., Far Hills, N.J. 07931

Continuation of Ser. No. 132,960, Dec. 15, 1987, abandoned.
This application Jun. 26, 1989, Ser. No. 372,188
Int. Cl.[5] G06F 15/24
U.S. Cl. 364—403 5 Claims

1. A method for the inventory of a large number of items comprising buildings, real estates and their fixtures, including the steps of:

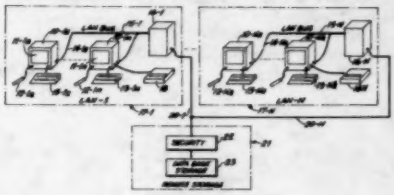
affixing a bar code label to each item to uniquely identify that item by a bar code designation data;

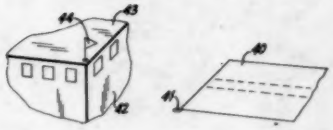
reading said labels using a portable hand-held bar code reader means to obtain designation data;

storing a collection of said code designation data in an initial bar code data storage means in said reader means and subsequently transferring said designation data to a digital computer system;

selecting a geographic marker at an airport runway as the basis for the geographic location of items;

obtaining geographic location data for each item providing the absolute geographic location comprising the latitude and longitude and elevation thereof within one foot of accuracy in relationship to the geographic marker, and associating said geographic location data with said code designation data to form inventory data in the computer system so that each item is identified by a code designation and a geographic location accurate within one foot;





displaying the said inventory data on the screen of computer work station terminal means under control of the computer system; said work station terminal means incuding a graphics display screen and using input means to alter the inventory data displayed on said screen.

4,920,489

APPARATUS AND METHOD FOR SOLID STATE STORAGE OF EPISODIC SIGNALS

Mark Hubelbank, Sudbury, and David Shadmon, Westbury, both of Mass., assignors to CardioData Inc., Northboro, Mass.

Filed Aug. 14, 1987, Ser. No. 85,879
Int. Cl.[5] G06F 15/42
U.S. Cl. 364—413.06 91 Claims

1. A method of digitally storing electrocardiogram signals in solid state memory, including the steps of:

(a) sampling analog electrocardiogram signals at a fixed sampling rate from at least one channel of an electrocardiogram apparatus,

(b) converting each sampled signal to a multibit digital sample representing its amplitude,

(c) calculating the differences in amplitude between each consecutive digital sample,

(d) identifying a predetermined number of groups of a predetermined number of consecutive digital samples having the highest sums of the absolute values of said differences,

(e) storing a number related to each digital sample from the ones of said predetermined number of groups,

(f) storing a number related to every Rth digital sample from the digital samples outside of said predetermined number

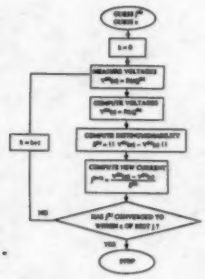
of groups, where R is an integer greater than one and is a function of the sampling rate.

4,920,490

PROCESS AND APPARATUS FOR DISTINGUISHING CONDUCTIVITIES BY ELECTRIC CURRENT COMPUTED TOMOGRAPHY

David Isaacson, Latham, N.Y., assignor to Rensselaer Polytechnic Institute, Troy, N.Y.

Filed Jan. 28, 1988, Ser. No. 149,407
Int. Cl.[5] A61B 5/05
U.S. Cl. 364—413.13 **3 Claims**



1. In an electrical current computed imaging system, having a selected precision for the smallest voltage difference the system can measure in an array of electrodes on the surface of a body, a method of producing the best current pattern for applying to the array to distinguish between an unknown conductivity(σ) inside the body and a selected conductivity(s), comprising:

(a) applying an arbitrary current pattern (I^k) to the array to generate a voltage pattern ($V^k(\sigma)$) on the array for the unknown conductivity;

(b) measuring the voltage pattern for the unknown conductivity;

(c) calculating a voltage pattern ($V^k(s)$) for the selected conductivity;

(d) calculating the difference (δV^k)between the values $V^k(\sigma)$ and $V^k(s)$, according to the formulas:

$$\delta V^k = V^k(\sigma) - V^k(s)$$

and where L is the total number of electrodes 1 in the array;

(e) calculating a new current pattern (I^{k+1}) according to the equation;

$$I^{k+1} = \delta V^k / \| \delta V^k \|$$

where $\| \delta V^k \| = \left[\sum_{l=1}^{L} (\delta V_l)^2 \right]^{\frac{1}{2}}$; and

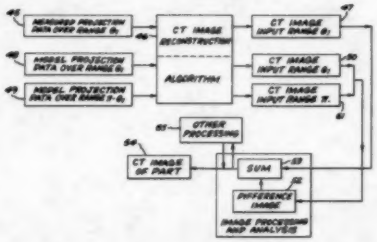
(f) if the absolute value of the difference between the arbitrary current pattern and the new current pattern is equal to or less than the selected precision, applying the arbitrary current pattern to the array of electrodes as the best current pattern, and if the absolute value of the difference between the arbitrary current pattern and the new current pattern is greater than the selected precision, applying the new current pattern to the array of electrodes and repeating steps (b) through (f), until the difference between the absolute value of the new current pattern and a preceding current pattern is equal to or less than the selected precision.

4,920,491

ENHANCEMENT OF IMAGE QUALITY BY UTILIZATION OF A PRIORI INFORMATION

Jeffrey W. Eberhard, and Kristina H. Hedengren, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 16, 1988, Ser. No. 194,235
Int. Cl.[5] G01N 23/04; G06F 15/42
U.S. Cl. 364—413.19 **10 Claims**



1. A method of NDE (non-destructive evaluation) imaging by incorporating a priori information comprising:

scanning a part with an imaging agent over an available scanning range an generating measured imaging parameter data;

providing a three-dimensional model of said part and calculating relevant part geometry, and providing selected physical properties of said part and said imaging agent;

combining said part geometry and physical properties and determining calculated imaging parameter data over an unavailable scanning range that cannot be scanned due to a constraint by calculating imaging agent path lengths through said model and calculating attenuation of said imaging agent from said physical properties; and

forming an image of said part from said measured and calculated data.

4,920,492

METHOD OF INPUTTING CHINESE CHARACTERS AND KEYBOARD FOR USE WITH SAME

Jeff Wang, Taipei, Taiwan, assignor to Buck S. Tsai, Taipei, Taiwan, a part interest

Filed Dec. 1, 1987, Ser. No. 127,069
Claims priority, application China, Jun. 22, 1987, 76103564
Int. Cl.[5] G06F 15/38
U.S. Cl. 364—419 **2 Claims**

1. An improved method of inputting Chinese characters and phrases, each of the phrases including more than two characters, each of the character including at least one radical, and each of the radical including at least one stroke, wherein 244 basic radicals for forming the characters are associated with 41 keys of a computer keyboard, comprising the following steps:

(A) Tracking stroke orders of the Chinese character, indexing the character by keying in the corresponding radicals, each of the radicals being keyed in with a code keying in one time, and completing the entry of the character with four codes at most, including a first, a second, a third and a last code, in which the steps for inputting the radicals comprising:

(1) selecting a radical covering as many strokes as possible without taking consideration of stroke orders;

(2) using at most four codes for a character while omitting the code between the third code and the last code;

(3) entering first the radical in the middle portion of a character in case the middle portion is flanked symmetrically by a left side portion and a right side portion, with the exception that the side portions are " ", " ", " " or " ";

(4) entering first a radical enclosing the remaining strokes of a character on four sides or three sides or upper left and right sides;

(5) entering a radical enclosing the remaining stroke of a character on lower left and right sides after inputting the remaining stroke, for example, " " and " ";

(6) entering directly the radicals of " " and " " if their strokes are completed before crossing by the other stroke, for example, " " and " "; otherwise, the radical of " " is keyed in alternatively, for example, " " and " ";

(7) entering the radical of " " by " " instead of " " in case the radical is crossed with other stroke, for example, " " being keyed in by " " instead of " "; and

(8) entering directly the radical of " " is without taking consideration of the stroke contained therein; and

(B) entering the phrases of two characters by inputting at most four codes, including the first and the last code of each character; and keying in the phrases of more than two characters by inputting at most four codes, including the first code of each of the former three characters and the last code of the last character.

4,920,493

TRANSDUCER CONTROL IN VEHICLE BRAKING SYSTEMS

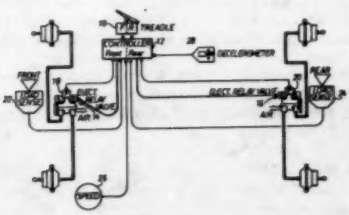
Malcolm Brearley, Solihull, and Richard B. Moseley, Birmingham, both of England, assignors to Lucas Industries public limited company, Birmingham, England, England

Filed May 18, 1987, Ser. No. 56,625

Claims priority, application United Kingdom, May 17, 1986, 8612065

Int. Cl.[5] G01L *25/00*; G06F *15/20*

U.S. Cl. 364—426.01 **9 Claims**



1. In a braking system of the type having electronic control for determining the extent of application of the vehicle brakes in accordance with driver braking demands, the system comprising:

(a) an electronic control computer; and

(b) a plurality of analog transducers which provide analog input signals to said electronic control computer representative of a corresponding plurality of variable braking operating parameters;

the improvement wherein, in order to enable recalibration of said transducers, the system further comprises within said computer

(c) an operator-controlled gate means;

(d) a comparator means having first and second inputs;

(e) the outputs of said transducers being selectably connectable to said first input of the comparator means by way of said gate means;

(f) non-volatile read/write memory means for storing zero and tare values for said variable braking operating parameters;

(g) the output of said non-volatile rear/write memory means being connected to said second input of said comparator means, whereby existing zero and tare values stored in said memory means can be compared in said comparator means with new zero and tare values supplied by said transducers; and

(h) the output of said comparator means providing a control signal coupled to said non-volatile read/write memory, whereby, if the result of said comparison lies within prescribed limits, said new zero and tare values are accepted and introduced into said non-volatile read/write memory means to override the existing zero and tare values but only after pre-established conditions have been met.

4,920,494

FUEL MONITORING ARRANGEMENT FOR AUTOMOTIVE INTERNAL COMBUSTION ENGINE CONTROL SYSTEM

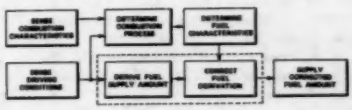
Toshimi Abo, Yokohama; Hiroshi Satoh, and Nobutaka Takahashi, both of Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 9, 1987, Ser. No. 94,979

Claims priority, application Japan, Sep. 9, 1986, 61-212006

Int. Cl.[5] F02D *43/00*

U.S. Cl. 364—431.05 **21 Claims**



1. In a method of controlling an internal combustion engine the steps of:

sensing a parameter which varies with the combustion process which occurs in a combination chamber;

determining a first variable based on the sensing of said parameter; and

determining the type of fuel being supplied to the engine using said first variable;

wherein said sensing step takes the form of sensing the pressure which develops in the combustion chamber, wherein said pressure is sensed over a predetermined crank angle range and wherein the magnitude of the sensed pressure is recorded along with the corresponding crank angle at predetermined intervals;

wherein said step of determining said first variable includes determining and recording the maximum pressure and corresponding crank angle for each of a predetermined number of engine cycles; and

wherein said fuel type determining step comprises: determining the cycle at which the highest maximum pressure occurs; comparing this with a predetermined cycle; and

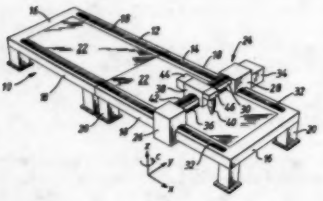
determining the fuel to be a first type when the cycle at which the highest maximum pressure occurs, occurs before said predetermined cycle; and determining the fuel to a second type when the cycle at which the highest maximum pressure occurs, occurs after said predetermined cycle.

4,920,495

SHEET CUTTING MACHINE

Donald J. Pilkington, Kettering, United Kingdom, assignor to GFM Holdings AG, Austria

Filed Jul. 15, 1988, Ser. No. 219,670
Int. Cl.[5] G06F *15/00*; G05B *19/00*
U.S. Cl. 364—474.37 **29 Claims**



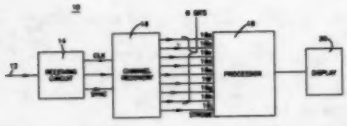
1. A machine for cutting sheet-like workpieces, comprising:
a work surface on which to lay a sheet-like workpiece;
a cutting blade;
a guidance system for guiding the blade along a cutting path to cut the workpiece along that path; and
means to adjust the height of the blade as the blade moves along the cutting path;
characterised in that:
the height adjusting means includes a memory which stores data indicative of irregularities of the guidance system and the work surface relative to each other, the height adjusting means being responsive to the stored data in adjusting the height of the blade.

4,920,496

APPARATUS AND METHOD FOR CALCULATING SIGNAL LEVEL IN DECIBELS

Ed Szczebak, Jr., Plano, assignor to Reliance Comm/Tec Corporation, Chicago, Ill.

Filed Apr. 1, 1988, Ser. No. 176,766
Int. Cl.[5] G01R *29/26*; G06F *15/332*
U.S. Cl. 364—481 **14 Claims**



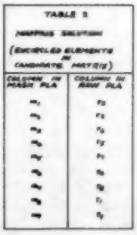
1. Apparatus for calculating signal level in decibels of a digitally encoded signal, said apparatus comprising:
(a) data storage means having stored therein in a first plurality of locations a first plurality of values representing signal amplitude squared, each of said first locations storing an associated one of said first values, said data storage means also having a second plurality of locations forming a table, each of said second plurality of locations having stored therein an associated one of a second plurality of values representing a range of amplitude level in decibels, each of said plurality of values differing from an adjacent value by a predetermined amount;
(b) means for periodically sampling a predetermined number of times said digitally encoded signal for addressing that one of said first locations associated with each of said samples and reading out said associated one of said first plurality of values;
(c) means responsive to each of said readout first values for determining for said predetermined number of times a sum of all of said readout first values; and
(d) means responsive to said sum for calculating from where in said table that one of said second locations wherein said stored associated second value is just less than said sum is located, one end of said range and said predetermined differing amount, said amplitude level in decibels.

4,920,497

METHOD FOR RENDERING USUABLE A DEFECTIVE RAW PROGRAMMABLE LOGIC ARRAY AND A DEFECTIVE PROGRAMMABLE LOGIC ARRAY RENDERED USABLE BY THIS METHOD

Shambhu J. Upadhyaya, Williamsville, and Michael Demjanenko, North Tonawanda, both of N.Y., assignors to State University of New York, Albany, N.Y.

Filed Oct. 27, 1987, Ser. No. 114,290
Int. Cl.[5] G06F *11/20*
U.S. Cl. 364—491 **14 Claims**



1. A method of rendering usable a defective raw Programmable Logic Array (PLA) to obtain the same results as would be obtained if the PLA was not defective and mapped with a mask logic array, said method comprising:
locating the defects within said defective raw logic array;
reconfiguring the columns of the mask logic array to avoid such defects; and
mapping said reconfigured mask logic array onto said raw logic array so as to "mask said defects", wherein said reconfiguring and mapping utilizes non-defective elements of at least one column which contains a defect.

4,920,498

METHOD OF PROCESSING AND ANALYZING ELECTROPHORETIC IMAGE, AND METHOD OF DISPLAYING ELECTROPHOREGRAM AND A MEDIUM FOR RECORDING ELECTROPHOREGRAM

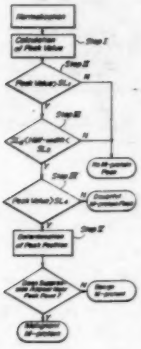
Nobutaka Kaneko, Hachioji, assignor to Olympus Optical Co., Ltd., Japan

Filed Aug. 6, 1986, Ser. No. 893,814
Claims priority, application Japan, Aug. 17, 1985, 60-180031; Aug. 17, 1985, 60-180032; Aug. 27, 1985, 60-186533; May 28, 1986, 61-122883
Int. Cl.[5] G06F *15/42*; C25D *13/06*
U.S. Cl. 364—497 **34 Claims**

1. A method of producing a normalized electrophoregram, comprising the steps of:
photoelectrically scanning an electrophoretic image of a test sample to derive an electrophoretic image signal;
sampling the electrophoretic image signal to derive a num-

ber of data samples and storing said samples in a memory of a digital computer;

referencing said stored data samples to detect at least two reference points on the electrophoretic image; and



adjusting said stored data samples to make said reference points coincident with at least two predetermined points on an electrophoregram having a predetermined electrophoretic expansion length to produce a normalized electrophoregram.

4,920,499

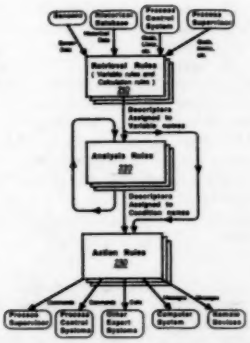
EXPERT SYSTEM WITH NATURAL-LANGUAGE RULE UPDATING

Richard D. Skeirik, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 30, 1987, Ser. No. 103,050

Int. Cl.[5] G06F *15/46*

U.S. Cl. 364—513 **32 Claims**



1. An expert system comprising:

a processor connected to receive inputs from a plurality of sources;

a collection of inference rules which are executable by said processor; and

one or more output channels, connected so that said processor provides outputs on said output channels in accordance with inputs received on said input channels;

wherein said processor is also configured to, on command of a user, present said inference rules in a constrained format which is readily understandable by a user who is not necessarily competent in any computer language, and permit said user to alter said executable rules by modifying said rules within said constrained substantially natural language format.

4,920,500

METHOD AND ROBOT INSTALLATION FOR PROGRAMMED CONTROL OF A WORKING TOOL

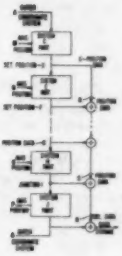
Amund Hetland, Vell, and Odd T. Hoie, Sandnes, both of Norway, assignors to Trallfa Robot A/S, Bryne, Norway

PCT No. PCT/NO86/00021, § 371 Date Oct. 28, 1987, § 102(e) Date Oct. 28, 1987, PCT Pub. No. WO87/04968, PCT Pub. Date Aug. 27, 1987

PCT Filed Feb. 25, 1986, Ser. No. 112,720

Int. Cl.[5] G06F *15/46*; G05B *19/42*

U.S. Cl. 364—513 **12 Claims**



1. A method for programmed control of a working tool to perform processing operations on an object by means of a movable servo-actuated robot arm system having more than six degrees of freedom and on the basis of preprogrammed tool path data stored in a data memory, comprising:

deriving the stored tool path data in an outer coordinate system separate from the robot arm coordinate system;

subdividing the robot arm system into system parts for coordinate transformation to an inner reference coordinate system associated with the robot arm system and which are movable with respect to each other and each having at least six degrees of freedom;

deriving the positional data for each system part, apart from at least one system part connected with the inner reference coordinate system;

storing in a memory said positional data in addition to the preprogrammed tool path data; and

using said stored data in conjunction with directly sensor-derived information as to the positional relation between said inner and outer coordinate systems as coordinate transformation data for appropriately correlating the programmed control of the working tool on the basis of the stored tool path data in the outer coordinate system at all times with the inner reference coordinate system associated with the robot arm system.

4,920,501

DIGITAL HALFTONING WITH MINIMUM VISUAL MODULATION PATTERNS

James R. Sullivan, Spencerport, and Rodney L. Miller, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 19, 1988, Ser. No. 259,940

Int. Cl.[5] H04N *1/40*; G06F *15/62*

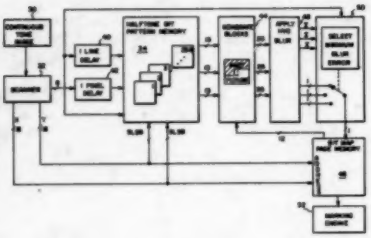
U.S. Cl. 364—518 **18 Claims**

1. A method of generating a halftone image with an electronic digital computer, comprising the steps of:

a. providing a set of minimum visual noise L×M bit binery patterns by employing a stochastic combinatorial minimi-

zation technique and a human visual modulation transfer function (MTF) weighting function to generate a halftone bit pattern for each density level of the multi-level digital image signal, each pattern corresponding to a possible density level of a multiple level digital image signal;

b. providing a digital image having pixel values representing density levels; and



c. for each pixel value of the digital image signal, modularly selecting a portion of the binary bit pattern from the corresponding pattern of the set by addressing the bit pattern with lower significant bits of an x,y pixel address associated with each pixel, and employing the selected portion to form the halftone image.

4,920,502

IMAGE PROCESSING APPARATUS WHICH SELECTABLY OUTPUTS IMAGE INFORMATION

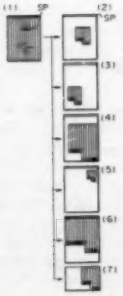
Masanori Yamada, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 93,083, Aug. 31, 1987, abandoned, which is a continuation of Ser. No. 673,410, Nov. 20, 1984, abandoned. This application Mar. 3, 1988, Ser. No. 166,801

Claims priority, application Japan, Nov. 25, 1983, 58-222837; Nov. 25, 1983, 58-222617; Nov. 25, 1983, 58-222618

Int. Cl.[5] G06F *15/62*

U.S. Cl. 364—518 **46 Claims**



1. An image processing system comprising:

image input means for reading image information;

data input means for inputting data relative to a plurality of image areas containing the image information, wherein said data input means includes indicating means for indicating the order in which the image information should be output;

instructing means for providing a start instruction signal to initiate image processing; and

control means for controlling said image input means such that input processing by said image input means is executed the same number of times as the number of the plurality of image areas corresponding to said input data, in response to a start instruction signal from said instructing means,

wherein said control means controls said image input means such that only one image area is input for each input processing.

4,920,503

COMPUTER REMOTE CONTROL THROUGH A VIDEO SIGNAL

Gary M. Cook, Pepperell, Mass., assignor to PC Connection, Inc., Marlow, N.H.

Filed May 27, 1988, Ser. No. 199,624

Int. Cl.[5] G06F *3/00*; H04N *7/08*

U.S. Cl. 364—521 **18 Claims**

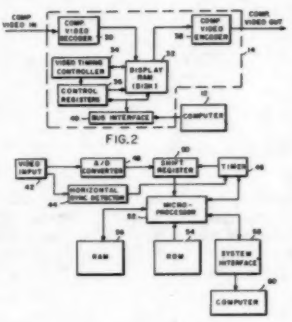


FIG.2

15. A system for simultaneously providing computer data and a video picture comprising;

means for providing a video signal;

means for modifying said video signal by substituting black or white pixels representative of computer data for a plurality of video pixels;

a transmitter whioh transmits said modified video signal;

a receiver which receives said modified video signal;

means for displaying a video picture corresponding to said modified video signal;

a horizontal sync detector;

timer means for counting out time intervals after a horizontal sync pulse is detected by said horizontal sync detector;

a shift register for successively obtaining a bit from said modified video signal in response to said timer means so as to extract from the modified video signal a byte of the computer data represented by said substituted black and white pixels; and

an interface which permits a computer to access said byte of computer data.

4,920,504

DISPLAY MANAGING ARRANGEMENT WITH A DISPLAY MEMORY DIVIDED INTO A MATRIX OF MEMORY BLOCKS, EACH SERVING AS A UNIT FOR DISPLAY MANAGEMENT

Hachiro Sawada; Tadashi Fujitsu; Ken-ichi Takahashi, and Hideaki Honma, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Sep. 17, 1986, Ser. No. 908,432

Claims priority, application Japan, Sep. 17, 1985, 60-203478; Dec. 13, 1985, 60-280368

Int. Cl.[5] G06F *3/153*

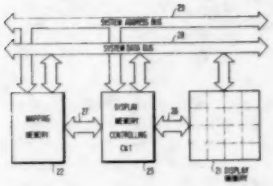
U.S. Cl. 364—521 **4 Claims**

1. In a display managing arrangement comprising a display memory for memorizing an image part of an image datum and a display memory controller for controlling said display memory to specify a display part on said image part, said display

memory comprising a plurality of memory blocks arranged as a matrix of rows, N in number, and columns, M in number, each of said memory blocks comprising a plurality of memory elements arranged as another matrix of rows, n in number, and columns, m in number, and having serial memory element addresses, respectively, said serial memory element addresses consecutively increasing along each row of the memory elements of said display memory and stepwise increasing by a block step value mM between two column-wise consecutive ones of said memory elements, wherein said display memory controller comprises:

a determinant register for storing signals representative of the numbers m and n, said step value, a block column range, and a block row range, said block column and row ranges specifying specific ones of said memory blocks as specific memory blocks by the numbers M and N;

a top address register for storing a signal representative of a top address for each of the memory blocks of said display memory, said top address being the serial memory element address which is least among the serial memory element addresses of said each of the memory blocks;



a first address generator coupled to said determinant register and to said top address register for generating a first address signal representative of a first portion of said serial memory element addresses for each of said specific memory blocks, said first portion being consecutive from said top address to one of said serial memory element addresses that is equal to said top address plus m less one;

a second address generator coupled to said determinant register and to said top address register for generating a second address signal representative of a second portion of said serial memory element addresses, said second portion being congruent modulo said block step value with the top address plus integral multiples of said step value, said integral multiples being from zero to the number n less one; and

accessing means connected to said first and said second address generators and to said display memory for accessing the serial memory element addresses of each of said specific memory blocks.

4,920,505

PROJECTION EXPOSURE APPARATUS

Kazuaki Suzuki, Tokyo, Japan, assignor to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 938,610, Dec. 5, 1986, abandoned. This application Aug. 2, 1989, Ser. No. 390,482

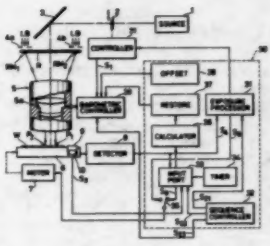
Claims priority, application Japan, Dec. 11, 1985, 60-278277

Int. Cl.[5] G03B 27/52

U.S. Cl. 364—525 **11 Claims**

7. In a projection exposure apparatus provided with (i) a projection optical system employing light energy from an illuminated object to form an image of the object on a workpiece, (ii) means for monitoring the light energy supplied to said projection optical system, (iii) means for prestoring a time constant relating to changes in imaging characteristics of said projection optical system caused by heat absorption and radiation of said optical system, (iv) means for predicting changes in said imaging characteristics on the basis of a relationship among said time constant, an output from said monitoring means, and a time lapse, and (v) means for adjusting the positional relation between said image and said workpiece on the basis of an output from said predicting means, a method for adjusting a state of the object image on said workpiece when said relationship has been interrupted, comprising the steps of:

(a) measuring values of an imaging characteristic of said projection optical system at plural discrete moments during a measurement period, said measuring being performed when said relationship has been interrupted;



(b) determining deviations of respective measured values from designed values to product data representing corresponding change values of said imaging characteristics;

(c) determining said relationship on the basis of said prestored time constant and said data; and

(d) adjusting the positional relation between said image and said workpiece according to the determined relationship.

4,920,506

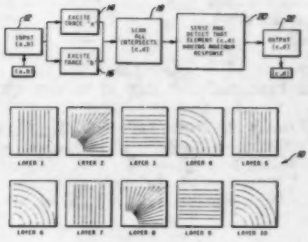
ULTRA-HIGH SPEED TWO-DIMENSIONAL COORDINATE TRANSFORM PROCESSOR

Patrick F. Castelaz, Yorba Linda, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 7, 1988, Ser. No. 255,083

Int. Cl.[5] G06J 1/00; G06G 7/22

U.S. Cl. 364—602 **19 Claims**



1. In a processor for performing coordinate transformations the improvement comprising:

a first set of layers of planar members each having signal conducting lines representing coordinate lines in a first coordinate system;

a second set of layers of planar members each having signal conducting lines representing coordinate lines in a second coordinate system;

layers in said first set being positioned adjacent to said layers in the second set so that each layer in said first set is positioned between successive layers in said second set;

means for applying a signal to selected ones of said signal conducting lines in said first set of layers, said selected

lines intersecting at a point that represents a point in said first coordinate system;

means for detecting a signal in lines in said second set of layers, said signal being induced by said signal applied at said first intersection in said first set of layers; and

means for comparing said detected signal at various intersecting points in said second set of layers, wherein the intersecting point that is nearest said first intersecting point in said first set of layers can be determined by the strength of the detected signal.

4,920,507

RECURSIVE DIGITAL FILTER WITH LESS NO-SIGNAL NOISE

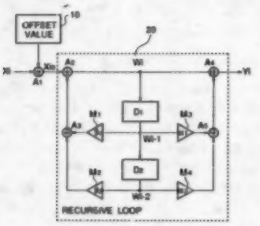
Masahiro Takeda, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 31, 1989, Ser. No. 387,298

Claims priority, application Japan, Jul. 29, 1988, 63-189840

Int. Cl.[5] G06F *15/31*

U.S. Cl. 364—724.17 **5 Claims**



1. A recursive digital filter comprising an input terminal receiving an input signal, an output terminal for outputting a filtered signal, an offset value circuit for outputting a predetermined offset value, an offsetting adder having a first input connected to said input terminal and a second input connected to receive said predetermined offset value from said offset value circuit, and a recursive digital filter loop having an input connected to an output of said offsetting adder and an output connected to said output terminal, whereby even if no signal is inputted, the recursive digital filter operates without occurrence of a limit cycle.

4,920,508

MULTISTAGE DIGITAL SIGNAL MULTIPLICATION AND ADDITION

Mohamad H. Yassaie, Bristol; Anthony D. King-Smith, Dursley, and Clive M. Dyson, Bristol, all of England, assignors to Inmos Limited, Bristol, England

Filed May 19, 1987, Ser. No. 52,249

Claims priority, application United Kingdom, May 22, 1986, 8612453

Int. Cl.[5] G06F *7/38*

U.S. Cl. 364—736 **17 Claims**

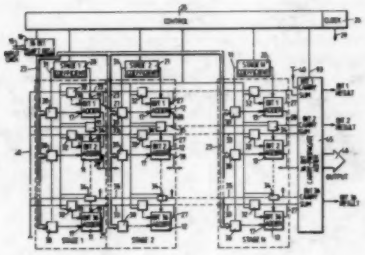
1. Multistage digital signal multiplying and adding apparatus for effecting repeated addition to achieve multiplication and addition together of a plurality of results of said multiplication, said apparatus comprising a plurality of addition stages, each stage having:

a plurality of adding circuits at successive bit positions of different significance in a product to be formed by multiplication of a first digital signal for that stage with a second digital signal for that stage,

each adding circuit being coupled (a) for forming partial products within each stage by successive operations using the first digital signal and a selected bit of the second digital signal, and (b) for adding successive partial products derived from use of bits of the second digital signal thereby forming the product after accumulation of a last partial product,

each adding circuit providing after each partial product accumulation a first output indicating a sum for that bit position and a second output indicating any carry signal to be carried from that bit position to a bit position of greater significance, and

selector circuitry interconnecting said adding circuits for selecting between (a) a first condition to supply signals from said first and second outputs of adding circuits



within a stage to respective adding circuit within said stage for use in accumulation with further partial products and (b) a second condition to supply signals from the first and second outputs of adding circuits within a stage after accumulation of the last partial product as to input to adding circuitry external to said stage for forming an addition of the products of more than one stage, said selector circuitry being operative for any one addition stage to change to said second condition without resolving carry signals in said one addition stage through all bit positions within said one addition stage.

4,920,509

BINARY CALCULATION CIRCUIT

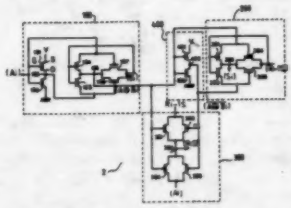
Hedi Hmida, Paris, and Pierre Duhamel, Issy Les Moulineaux, both of France, assignors to Etat Francais, represente par le ministres Delegue des Postes et Telecommunications (Centre National d'Etudes des Telecommunications), Issy Les Moulineaux, France

Filed Mar. 11, 1988, Ser. No. 167,787

Claims priority, application France, Mar. 18, 1987, 87 03758

Int. Cl.[5] G06F *7/50*

U.S. Cl. 364—784 **12 Claims**



1. A binary complementary MOS calculation cell, having:

a first input for receiving a first input bit;

a second input for receiving a second input bit;

a third input for receiving a third input bit;

a first logic operator means comprising:

(i) a first pair of same polarity transistors forming a series source-to-drain arrangement between a reference voltage

terminal and a free drain of one of said transistors, with each of the gates of the transistors of the first pair receiving one of said first and second input bits, said free drain delivering a first intermediate signal, said first intermediate signal being a complemented exclusive-OR function of said first and second input bits;

(ii) a second pair of same polarity transistors, said polarity being opposite the polarity of the first pair and forming a symmetrical drain-to-gate arrangement, the gate of each transistor of the second pair being connected to the drain of the other transistor of the second pair, with the sources of the second pair being connected to said free drain of said first pair, and each of the drains of the second pair receiving one of said first and second input bits;

a logic invertor means, connected to said free drain of the first pair, for delivering a second intermediate signal said second intermediate signal being a complement of said first intermediate signal;

a second logic operator means for generating a first output bit, said first output bit being a symmetrical exclusive-OR function of said third input bit and both said first and second intermediate signals;

a third logic operator means for generating a second output bit, said second output bit being a logic symmetrical trigger function representing either a preselected one of said first and second input bits and said third input bit depending upon both said first and second intermediate signals;

a first output for receiving said first output bit; and

a second output for receiving said second output bit.

4,920,510

SAMPLE DATA BAND-PASS FILTER DEVICE

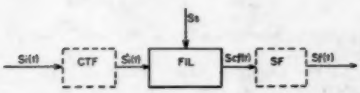
Daniel Senderowicz, Berkeley, Calif.; Guido Torelli, South Alessio, and Germano Nicollini, Piacenza, both of Italy, assignors to SGS Microelectronica SpA, Cantania, Italy

Filed Jun. 17, 1987, Ser. No. 63,258

Claims priority, application Italy, Jun. 20, 1986, 20876 A/86

Int. Cl.[5] G06G *7/02*; H03H *19/00*

U.S. Cl. 364—825 **5 Claims**



1. A signal processing system comprising, in combination:

a sampled-data band-pass filter means connected to receive an unattenuated input signal at a frequency included within an interval comprised between a first frequency (fsL) and a second frequency (fsH), which encompass a third frequency (fsO); said sampled-data band-pass filter means including a sampler means operating at a sampling frequency (fs) and band-pass means,

said sampler means automatically performing a low-frequency shift of said unattenuated input signal which encompasses a fourth frequency (f0), wherein said sampling frequency is equal to a whole submultiple of the sum of said third frequency (fsO) and said fourth frequency (f0),

said band-pass means having, as its lower cutoff frequency, the difference between the sampling frequency and the second frequency (fs−fsH) and as its upper cutoff frequency the difference between the sampling frequency and the first frequency (fs−fsL).

4,920,511

DATA PORT SELECTION

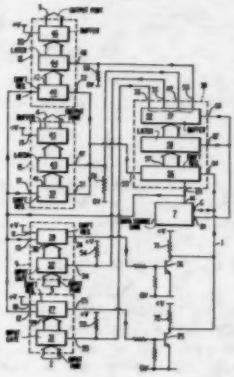
Geoffrey Brier, and Mark W. Rayne, both of Cambridge, England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 9, 1987, Ser. No. 130,814

Claims priority, application United Kingdom, Dec. 12, 1986, 8629755

Int. Cl.[5] G06F *13/00*

U.S. Cl. 364—900 **23 Claims**



1. Apparatus for selecting one of a plurality of parallel data ports and for transferring data between the one port and a serial data path, the apparatus comprising:

(a) a first shift register having a serial data input coupled to the serial data path and having a parallel output;

(b) at least one respective further shift register for coupling with a respective one of the parallel data ports and having a respective serial data terminal coupled to the serial data path and having a plurality of stages, the serial data terminal being one of an input and an output, according to whether the further shift register is for coupling with an output or an input parallel data port, respectively;

(c) a plurality of respective means for coupling the stages of said at least one further shift register to the plurality of parallel data ports, there being one respective means for coupling for each of the plurality of parallel data ports and each of said respective means for coupling having a respective enable control input;

(d) further means for coupling the parallel output of the first shift register to the enable control inputs of the respective means for coupling; and

(e) means for enabling said further means for coupling to select and enable one of said respective means for coupling, that corresponds to the one port, according to contents of the first shift register.

4,920,512

NON-VOLATILE SEMICONDUCTOR MEMORY CAPABLE OF READILY ERASING DATA

Hiroshi Miyamoto, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 28, 1988, Ser. No. 213,106

Claims priority, application Japan, Jun. 30, 1987, 62-160837; Jul. 13, 1987, 62-175250

Int. Cl.[5] G11C *7/00, 11/40, 11/44*

U.S. Cl. 365—160 **8 Claims**

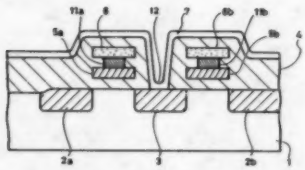
1. A non-volatile semiconductor memory comprising:

a semiconductor substrate having a main surface and a predetermined impurity concentration of a first conductivity type;

impurity regions of a second conductivity type formed

spaced apart from each other on the main surface of said semiconductor substrate, an area between said impurity regions of the second conductivity type defining a channel region;

a first conductive layer formed at least on said channel region with an insulating film interposed therebetween;



a second conductive layer formed on said first conductive layer with an insulating film interposed therebetween; and

switching means comprising a superconductive material for connecting said first conductive layer and said second conductive layer.

4,920,513

SEMICONDUCTOR MEMORY DEVICE USING DIODE-CAPACITOR COMBINATION

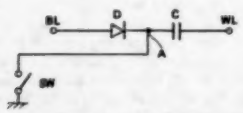
Kaneyoshi Takeshita, Tokyo, and Takeshi Matsushita, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 21, 1988, Ser. No. 171,486

Claims priority, application Japan, Mar. 24, 1987, 62-070950

Int. Cl.[5] G11C *7/00, 11/36*

U.S. Cl. 365—175 **9 Claims**



1. A semiconductor memory device having a number of memory cells, each of which is written to and read from individually, each of said cells comprising:

a diode having first and second electrodes, the first electrode beng connected to a bit line;

a storage capacitor having first and second terminals, the first terminal being connected at a point to the second electrode of the diode, the second terminal being connected to a word line; and

switch means for resetting said point to a predetermined potential, whereby said capacitor is positively reset in response to operation of said switch means.

4,920,514

OPERATIONAL INFORMATION DISPLAY SYSTEM

Shigeo Aoki, Inagi, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Apr. 13, 1988, Ser. No. 181,041

Claims priority, application Japan, Apr. 13, 1987, 62-88638

Int. Cl.[5] G06F *3/14, 15/40*

U.S. Cl. 364—521 **4 Claims**

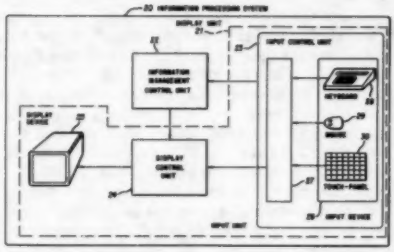
1. An operational information display system for a plurality of information processing functions, the execution of which are dependent on the previous execution of required functions in a sequential priority relationship, the system comprising:

a display for displaying information input to the system;

means for selectively displaying a diagram of the sequential priority relationship between the plurality of functions;

control means for indicating, on the diagram the identity of each previously executed required function; and

input means for sequentially selecting for execution any of



said required functions in the displayed priority order upon which a desired processing function is dependent, for reducing the time required for execution of the desired processing function.

4,920,515

PROGRAMMABLE LOGIC ARRAY HAVING AN IMPROVED TESTING ARRANGEMENT

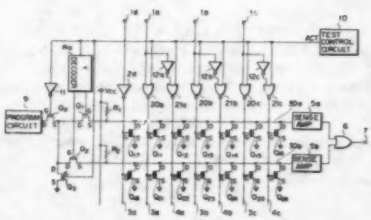
Takeo Obata, Osaka, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 19, 1988, Ser. No. 259,884

Claims priority, application Japan, Oct. 23, 1987, 62-268840

Int. Cl.[5] G11C *7/00*; H03K *19/173*

U.S. Cl. 365—189.08 **3 Claims**



1. A programmable logic array having an AND array, comprising:

a plurality of input lines (**1*a*–1*c***);

a plurality of product term lines (**30*a*, 30*b***);

a plurality of non-volatile memory elements (Q_{11}–Q_{16}, Q_{21}–Q_{26}) respectively interposed between said input lines and said product term lines;

a test line (**1*d***) for inputting a test signal, and test elements (Q_{17}, Q_{18}) respectively interposed between said test line and said product term lines; and

control means for, in a test mode for measuring AC characteristics of said programmable logic array, turning OFF those non-volatile memory elements which are connected to said input lines other than said test input line and setting to a low level all product term lines other than said product term line whose AC characteristics are to be measured to a low level, said means selectively applying to said test line a test signal causing said test elements to selectively alternate setting to a high level and a low level the product line whose AC characteristics are to be measured;

said programmable logic array including a program circuit (**9**), a gate transistor Q_0 through which said program circuit is coupled to said product term lines, line selection transistors (Q_1, Q_2) interposed in respective product term

lines between the point at which the product term lines are coupled with said program circuit through said gate transistor and the points at which the product term lines are coupled with said non-volatile elements, a decoder (8α) coupled with said line selection transistors to control their OFF/ON states, and a pull-up transistor (Q_3) coupled to said product term lines at points thereof which are between said gate transistor and said line selection transistors to selectively set respective lines to a low level.

4,920,516

READ ONLY MEMORY CIRCUIT HAVING A PRECHARGED SELECTED BIT LINE

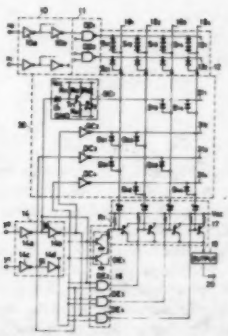
Yuji Tsuchimoto, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed May 5, 1988, Ser. No. 190,447

Claims priority, application Japan, May 12, 1987, 62-115314

Int. Cl.[5] G11C *13/00*

U.S. Cl. 365—203 **18 Claims**



1. A read only memory circuit comprising:

a memory cell array having a plurality of bit lines, a plurality of word lines and cells connected between the bit lines and word lines;

bit line selecting means operably coupled to said memory cell array for selecting one of the bit lines designated by a Y address and for precharging the selected bit line at a precharged potential;

word line selecting means operably coupled to said memory cell array for selecting one of the word lines by an X address;

signal output means operably connected to said plurality of cells for extracting a datum stored in one cell connected between said one bit line and said one word line designated by the supply of the X and Y addresses; and

discharge means having discharge lines respectively connected to said plurality of bit lines for discharging all the bit lines except for said one bit line designated by the Y address to thereby preclude delay in a signal rise in said one bit line selected by said bit line selecting means having said precharged potential.

4,920,517

SEMICONDUCTOR MEMORY DEVICE HAVING SUB BIT LINES

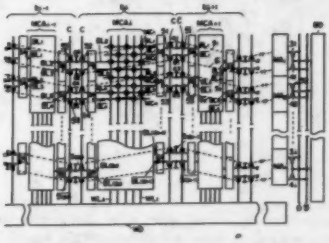
Hiroyuki Yamauchi, Hirakata; Toshio Yamada, Sakai, and Michihiro Inoue, Ikoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 40,471, Apr. 20, 1987, Pat. No. 4,807,194. This application Apr. 18, 1988, Ser. No. 182,895

Claims priority, application Japan, Apr. 24, 1986, 61-95364; Apr. 16, 1987, 62-93604; Jul. 1, 1987, 62-164544

Int. Cl.[5] G11C *7/00*

U.S. Cl. 365—207 **7 Claims**



1. A semiconductor memory device comprising:

a memory cell array having a plurality of bit lines disposed in a parallel manner, a plurality of word lines disposed in a parallel manner and intersected with said bit lines perpendicularly, a plurality of memory cells coupled between said bit and word lines for storing data therein;

a plurality of sense amplifiers disposed at both sides of said memory cell array in such manner that odd numbered sense amplifiers are disposed at one side of said memory cell array and even numbered sense amplifiers are disposed at the other side of said memory cell, said odd numbered sense amplifiers being coupled to odd numbered bit lines and said even numbered sense amplifiers being coupled to said even numbered bit lines;

a plurality of sub bit lines for coupling said sense amplifiers disposed at both sides of said memory cell array;

voltage control circuits coupled to said sense amplifiers for restricting an amplitude of signal voltages appearing on said sub bit lines; and

a pair of data busses coupled to said sub bit lines.

4,920,518

SEMICONDUCTOR INTEGRATED CIRCUIT WITH NONVOLATILE MEMORY

Hideo Nakamura, Tokyo, and Terumi Sawase, Sayama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 174,975, Mar. 29, 1988, Pat. No. 4,821,240, which is a continuation of Ser. No. 854,899, Apr. 23, 1986, Pat. No. 4,744,062. This application Mar. 28, 1989, Ser. No. 329,515

Claims priority, application Japan, Apr. 23, 1985, 60-86797; Apr. 26, 1985, 60-90268; Jul. 3, 1985, 60-144719

Int. Cl.[5] G11C *11/40*

U.S. Cl. 365—228 **7 Claims**

1. A microcomputer comprising:

a nonvolatile semiconductor memory, and

a processing unit,

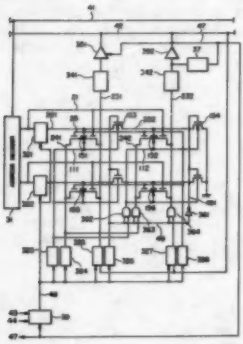
said nonvolatile semiconductor memory comprising:

a plurality of data memory elements arranged in a matrix;

a first means for accessing a selected one element within said plurality of data memory elements in accordance with an address signal specified with respect to said matrix;

a protecting data memory element for storing at least 1-bit protection data disposed within said matrix; and

a second means for reading out the content of said protecting data memory element, whereby whether a programming, erasing or reading operation with respect to said selected one element is to be allowed or inhibited is



determined in accordance with the content of said protecting data memory element, said content being read by said second means, wherein said data memory elements are respectively comprised of an electrically erasable and programmable memory element.

4,920,519

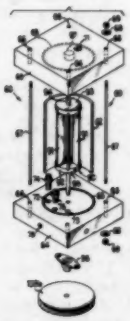
DUAL-PUMP MIXING AND FEEDING APPARATUS

Carl L. Brazelton, Austin, Tex.; Troy C. Litherland, Bradley, and James G. Johnston, Yorkville, both of Ill., assignors to Stranco, Inc., Bradley, Ill.

Filed Oct. 3, 1985, Ser. No. 783,854

Int. Cl.[5] B01F *5/04, 7/20, 15/02;* **G05D** *11/02*

U.S. Cl. 366—161 **13 Claims**



1. Mixing and feeding apparatus for receiving polymer and water and for activating and diluting the polymer, comprising a frame, a vessel mounted on said frame defining a substantially cylindrical chamber therein, said vessel having a water inlet and a first polymer inlet and a second polymer inlet and an outlet, means for carrying water to said wat.r inlet, first diaphragm-type metering pump means for pumping an emulsion polymer to said first polymer inlet, second gear pump means for pumping a solution polymer to said second polymer inlet, an impeller mounted in said chamber for rotation about the cylindrical axis thereof for mixing the polymer and the water, means for energizing said first pump means, means for energizing said second pump means, and control means for selectively controlling the operation of both of said means for energizing.

4,920,520

METHOD OF AND A DEVICE FOR SAFEGUARDING A VEHICLE OR MACHINERY MOVABLE IN SPACE

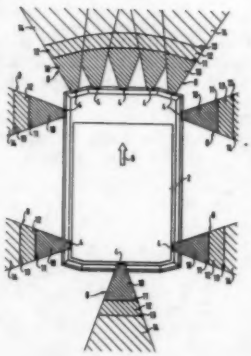
Ewald Göbel; Dieter Maurer, both of Karlsruhe, and Rigobert Opitz, Waldbronn, all of Fed. Rep. of Germany, assignors to IBP Pietzsch GmbH, Ettlingen, Fed. Rep. of Germany

Filed Sep. 7, 1988, Ser. No. 241,363

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1987, 3730105

Int. Cl.[5] G01S *15/00*

U.S. Cl. 367—99 **21 Claims**



1. A method of safeguarding a vehicle or machinery movable in space, such as a robot, a stacker, or an operatorless transporting vehicle against collision, wherein by the use of distance sensors, especially ultrasonic sensors with echo time measurement, the distance from an obstacle is measured and a reaction signal for acting on the vehicle movement is initiated when predetermined threshold values are not reached, said method comprising the steps of initiating the distance measurements in time synchronism for all sensors, and jointly processing the obtained measuring signals for producing at least a reaction signal.

4,920,521

METHOD AND SYSTEM FOR INTERPOLATION-PROCESSING DELAY TIME DATA

Tsuyoshi Yoshie, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 23, 1988, Ser. No. 159,336

Claims priority, application Japan, Feb. 24, 1987, 62-39154

Int. Cl.[5] G01S *15/06*

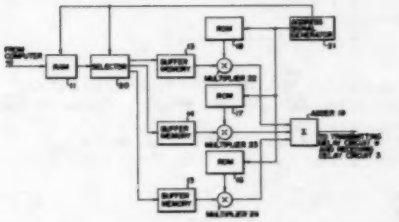
U.S. Cl. 367—103 **10 Claims**

1. A method for interpolation-processing delay time data utilized for operating a plurality of transducers incorporated in an ultrasonic probe, the method comprising the steps of:

setting delay time data;

interpolation-processing the set delay time data by calculat-

ing interpolative delay time data on the basis of the set time data; and



operating the transducers in accordance with the set delay time data and the interpolative delay time data.

4,920,522

METHOD AND APPARATUS FOR MEASURING ELECTRICAL OR MAGNETIC FIELDS

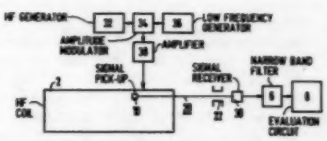
Wilhelm Duerr, Erlangen, and Ralph Oppelt, Uttenreuth-/Weiher, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 22, 1987, Ser. No. 41,216

Claims priority, application Fed. Rep. of Germany, May 6, 1986, 3615197

Int. Cl.[5] G01V *1/00*

U.S. Cl. 367—134 **7 Claims**



1. A method for measuring an electric or magnetic field comprising the steps of:

introducing a magnetic or electric dipole probe into a field to be measured which generates an electric signal characteristic of at least one parameter of said field;

converting said electric signal into a corresponding ultrasound signal;

transmitting said ultrasound signal to an ultrasound receiver remote from said probe; and

re-converting the received ultrasound signal into an electric signal capable of evaluation.

4,920,523

HYDROPHONE MOUNT

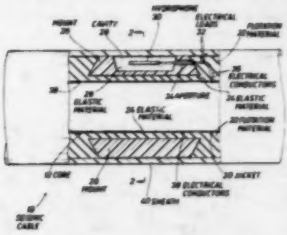
Vitold R. Kruka; Robert M. Kipp, and Edward R. Cadena, all of Houston, assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 22, 1981, Ser. No. 333,527

Int. Cl.[5] H04R *11/00*

U.S. Cl. 367—188 **12 Claims**

1. A hydrophone mount for use in a marine seismic cable having a central core, said mount comprising: a first housing portion having first and second apertures, first and second edges, and a cavity adapted for holding a hydrophone; a second housing portion having first and second apertures and first and second edges, said first and second housing portions being sized and shaped so that said first and second housing portions can be positioned adjacent to said core to form a housing around said core with said first edge of said first housing portion interlocking with said first edge of said second housing portion, said second edge of said first housing portion interlocking with said second edge of said second housing portion, and said first and second apertures of said first housing portion axially aligning respectively with said first and second apertures of said second housing portion; and a first member positioned in said aligned first apertures and a second member positioned in said aligned second apertures.



4,920,524

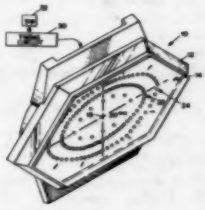
MULTIMODE DIGITAL TIMEPIECE

Mohammed N. Kotob, 58 Princeton St., 2nd Flr., Bridgeport, Conn. 06605

Filed Aug. 22, 1988, Ser. No. 234,537

Int. Cl.[5] G04C *17/02*

U.S. Cl. 368—240 **4 Claims**



1. In a timepiece, a display comprising:

means for generating timing signals;

a first array of elements illuminable in sequence in response to the timing signals to indicate hours;

a second array of sixty elements illuminable in sequence in response to the timing signals to indicate minutes; and

switch means for selecting between a normal mode of operation wherein the sixty elements of the second array are illuminated sequentially to indicate the passage of minutes in one-minute increments and a teaching mode of operation wherein only every fifth element of the second array is illuminated sequentially to indicate the passage of minutes in five-minute increments.

4,920,525

QUIET ALARM CLOCK

Jack B. Meister, 68 Chimney Ridge Dr., Covent Station, N.J. 07961

Continuation-in-part of Ser. No. 197,742, May 23, 1988, abandoned. This application Nov. 3, 1988, Ser. No. 267,236

Int. Cl.[5] G04C *21/00*; G04B *37/00*

U.S. Cl. 368—250 **10 Claims**

1. An alarm clock comprising:

a flat rectangular enclosure,

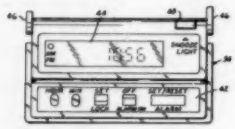
a vibrator including an electric motor positioned within said enclosure and responsive to application of electrical power for emitting mechanical vibration energy,

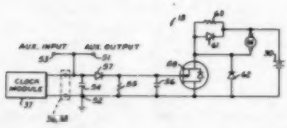
an electronic clock mouted within said enclosure and including a self-contained battery power source, means for set-

ting time of day and alarm time at said clock, an alphanmeric clock display positioned in one wall of said enclosure, and an alarm output, and

means including a second battery power source and solid-state electronic switch means within said enclosure responsive to said alarm output for connecting said second battery power source to said electric motor,

said electronic clock, including said self-contained battery





power source, said time setting means and said display, comprising a separate module removably fastened within said enclosure,

said enclosure including a generally rectangular pocket on said one wall, said electronic clock module being removable positioned in said pocket, there being mating electrical connection means on said module and in said pocket for securing said module in said pocket and feeding said alarm signal to said solid-state switch means.

4,920,526

TIMEPIECE ASSEMBLY INCLUDING SHEET WITH WRISTWATCH REMOVABLE THEREFROM

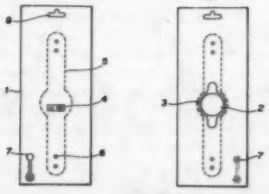
Yasuhiko Saito, Tokyo, Japan, assignor to Sony Creative Products Incorporation, Tokyo, Japan

Filed Aug. 15, 1988, Ser. No. 232,603

Claims priority, application Japan, Feb. 10, 1988, 63-16746[U]

Int. Cl.[5] G04B *37/00*

U.S. Cl. 368—281 **13 Claims**



1. A timepiece assembly that easily can be displayed by a merchant and that then may be converted into a wristwatch by a customer, said assembly comprising:

a sheet of a material that is suitable for forming a wristwatch band;

a timepiece movement fixed to a rear surface of said sheet, said timepiece movement having a time display section;

said sheet having formed therethrough an opening at a position and of a shape corresponding to said time display section; and

means defining on said sheet an outline of a shape suitable for use, upon removal of said shape from said sheet, as a wristwatch and an integral wristwatch band, said outline encompassing said opening and that area of said sheet to which is fixed said timepiece movement;

whereby, upon removal by a customer of said shape from said sheet, said removed shape having fixed thereto said timepiece movement may be employed by the customer as a wristwatch.

4,920,527

FOCUSING ERROR DETECTION APPARATUS

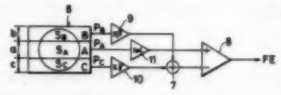
Takanori Maeda, Saitama, Japan, assignor to Pioneer Electronic Corp., Tokyo, Japan

Filed Jan. 7, 1988, Ser. No. 141,394

Claims priority, application Japan, Jan. 7, 1987, 62-2160

Int. Cl.[5] G11B *7/13*

U.S. Cl. 369—45 **8 Claims**



1. In a disk reproducing apparatus, a light beam focusing apparatus comprising:

a light beam source;

a light reception member divided, with respect to a first axis, into three light receiving portions, including a first light receiving portion having a first width a measured along a second axis perpendicular to said first axis, and second and third light receiving portions, one on either side of said first light receiving portion in a direction of said second axis, and having second and third widths b and c, respectively, measured along said second axis, said light reception member being positioned so as to intersect an optical axis of the light being emitted by said light beam source, first, second, and third photodetector outputs respectively being output in response to said light beams striking said first, second and third light receiving portions, said light beam having a radius r at a point of contact with said light reception surface; and

focus error signal producing means for combining said first, second, and third outputs to provide a focus error signal indicative of focus error,

wherein said first, second, and third widths are determined in accordance with the following formula:

$$2r+dc>a+b+c,$$

wherein dc is a maximum distance that said light beam can deviate along said second axis from a center of said first light receiving portion while said level of said focus error signal remains below a predetermined reference value.

4,920,528

METHOD OF DISK RECORDING USING ALTERNATIVE RECORDING TRACKS

Noriaki Sakamoto, Soraku; Yoshiki Nishioka, Tenri; Toshihiro Yamanaka, Ikoma; Nobuyuki Horie, Yamatokoriyama; Shozou Kobayashi; Toshihisa Deguchi, both of Nara, and Shigemi Maeda, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 19, 1987, Ser. No. 16,258

Claims priority, application Japan, Feb. 20, 1986, 61-36066; Feb. 20, 1986, 61-36069

Int. Cl.[5] G11B *27/36*

U.S. Cl. 369—54 **3 Claims**

1. A method for recording data on a disklike recording medium in a read after write system having a plurality of primary recording tracks, and a substitute map recording area with each of the plurality of primary recording tracks having a predetermined number of primary recording sectors and a

predetermined number of alternate recording sectors comprising the steps of:

(a) accessing one of said plurality of primary recording tracks;

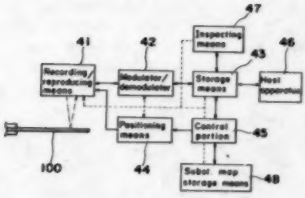
(b) accessing one of said predetermined number of primary recording sectors of said one primary recording track;

(c) determining whether said one primary recording sector contains errors;

(d) writing data to said one primary recording sector when errors are determined to be absent from said one recording sector;

(e) accessing one of said predetermined number of alternate recording sectors when errors are determined to exist in said one recording sector;

(f) determining whether said one alternate recording sector is available for writing data;



(g) writing data to said one alternate recording sector when said one alternate recording sector is available for writing data;

(h) determining whether one of said predetermined number of alternate recording sectors is available to be accessed when said one alternate recording sector fails to be available for writing data and accessing said one alternate recording sector that is determined to be available;

(i) repeating steps (f) - (h) when one of said predetermined number of alternate recording sectors is available to be accessed; and

(j) writing data to an alternate recording track and writing substitute map information to the substitute map recording area indicative of the location of said one primary recording track and said one primary recording sector when each of said predetermined number of alternate recording sectors fails to be available for access.

4,920,529

NETWORK CONTROL METHOD AND APPARATUS THEREFOR

Ryoichi Sasaki, Fujisawa; Tsutomu Nakamura, Musashino; Michio Suzuki, Yokohama; Kohsuke Shinnai, Machida; Nobuhiko Ido, Yokohama, and Tomoaki Tsunoda, Sagamihara, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Micro Computer Engineering Ltd., Kodaira, both of, Japan

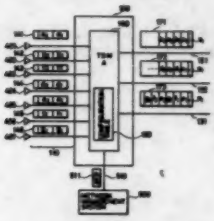
Filed Feb. 12, 1988, Ser. No. 155,416

Claims priority, application Japan, Feb. 27, 1987, 62-42676; Mar. 6, 1987, 62-50030

Int. Cl.[5] H04L *11/08*

U.S. Cl. 370—16 **7 Claims**

1. In a system comprising a TDM network, comprising a plurality of TDMs each comprising means for multiplexing data from subscriber circuits for communication and means for managing a local station, and communicating trunks connecting said TDMs mutually, and a network management system executing management of the network by interchanging management information through the means for managing of each TDM, a network control method wherein the aforesaid communicating trunks are divided into main communicating channels for interchanging user data and subordinate communicating channels for interchanging management information, and wherein communications of user data are executed by using the main communicating channels in accordance with a fixed routing table set before-hand, while communications of the



management information are executed by using one of flooding and source-routing functions, selected in accordance with the state of the aforesaid TDM network.

4,920,530

ADAPTIVE TIME-DISCRETE FILTER FOR FORMING A CANCELLING SIGNAL FROM SYNCHRONOUS DATA SYMBOLS

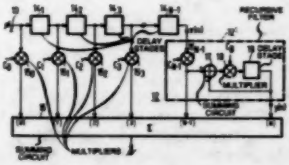
Kornelis J. Wouda, and Simon J. M. Tol, both of Hilversum, Netherlands, assignors to AT&T and Philips Telecommunications B.V., Hilversum, Netherlands

Filed Dec. 15, 1987, Ser. No. 132,293

Claims priority, application Netherlands, Dec. 22, 1986, 8603247

Int. Cl.[5] H04J *15/00*

U.S. Cl. 370—32.1 **4 Claims**



1. An adaptive time-discrete filter having an impulse response h(i) with i=0, 1, 2, . . . for forming a cancelling signal from synchronous data symbols,, this filter comprising a transversal filter section having adjustable coefficients C_i with $i=0,1,2,\ldots,N-1$ for realising the initial N values h(i) of the aforesaid impulse response, means for adaptively adjusting the filter coefficients C_i, a recursive filter section having coefficients for realising the values h(i) of the impulse response for i=N, N+1, . . . , as well as means for summing the output signals of both filter sections for obtaining the cancelling signal, characterized in that the time-discrete input signal x(n) of the recursive filter section is formed by the adaptive filter input signal delayed over N−1 discrete time intervals and the recursive filter section is suitable for forming a time-discrete output signal y(n) having a relationship with the input signal x(n) as expressed in the following equation

$$y(n)=C_B[C_A\times(n-1)+y(n-1)]$$

where C_A is equal to the last adjustable coefficient C_{N-1} of the transversal filter section and C_B is a predetermined fixed coefficient.

4,920,531

HEADER DRIVEN PACKET SWITCHING SYSTEM AND METHOD

Osamu Isono; Tetsuo Nishino, both of Kawasaki, and Eisuke Iwabuchi, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

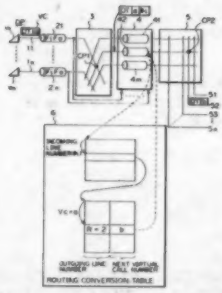
Filed Feb. 19, 1988, Ser. No. 157,621

Claims priority, application Japan, Feb. 19, 1987, 62-36736

The portion of the term of this patent subsequent to Jun. 6, 2006, has been disclaimed.

Int. Cl.[5] H04J 3/26

U.S. Cl. 370—60 **13 Claims**



1. A header driven packet switching system including hardware for routig a data packet coming through one of incoming lines and rewriting a header of said data packet according to routing information added to said header of said data packet, comprising:

a plurality of packet header processing circuits disposed indpendently from said incoming lines, for controlling the routing and header rewriting of said data packet; and

connecting means for detecting free circuits from among said plurality of packet header processing circuits, and for connecting said one incoming line with one of the detected free packet header processing circuits.

4,920,532

ELECTRICAL DEVICE COMMAND SYSTEM, SINGLE WIRE BUS AND SMART SINGLE CONTROLLER ARRANGEMENT THEREFOR

Thomas R. Wroblewski, Sterling Heights, Mich., assigner to Chrysler Corporation, Highland Park, Mich.

Filed Dec. 7, 1988, Ser. No. 280,917

The portion of the term of this patent subsequent to Mar. 6, 2007, has been disclaimed.

Int. Cl.[5] H04J 3/26

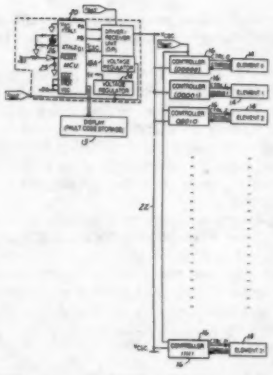
U.S. Cl. 370—85.1 **5 Claims**

1. A multiplex system within a motor vehicle for commanding and monitoring the status of a plurality of electrical devices or elements disposed throughout the motor vehicle, each of the elements having command terminals for receiving commands in the form of a discrete voltage signal for activating or deactivating each of the elements, one of the command terminals also being used to provide a status indication of each of the elements in the form of a current signal upon being commanded, said system comprising:

(a) a bi-directional, single wire bus for transmitting in a first direction a series of square wave double duty cycle voltage signals used for commanding ON or OFF the plurality of elements and for transmitting in a second direction, a series of current signals used for indicating the ON or OFF status of the plurality of elements;

(b) a plurality of smart single controllers disposed throughout the motor vehicle, each one of said single controllers being disposed near one of the elements for commanding the element ON or OFF, each one of said single controllers having:

1. a single input/output terminal connected by a single wire to a single point along said bus for receiving the square-wave voltage signal;
2. integration means for converting the square-wave voltage signal into a dual-amplitude, sawtooth-pulse waveform containing address and data information wherein a first amplitude pulse represents LOW bit and a second amplitude pulse represents HIGH bits;
3. detection means for detecting an address code of said sawtooth-pulse waveform in order to enable said single controller to command the accompanying element when the detected address code matches a preprogrammed address of said single controller;
4. means for detecting a data bit code from said sawtooth-pulse waveform in order to determine whether to turn ON or OFF the accompanying element;
5. means for commanding the accompanying element ON or OFF, said commanding means including means for transmitting a current signal back over said bus indicative of the status of the element after commanding the element ON or OFF;



c. a driver and receiver means, receiving power from a power source of the vehicle and connected to said single-wire bus, for generating the series of square-wave, double-duty cycle voltage signals used by each of said single controllers; said driver and receiver means also including means for receiving the status of the elements indicating current signals transmitted over said bus;

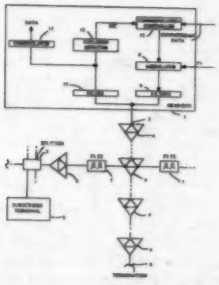
d. display means for displaying the status of the plurality of elements; and

e. a microcomputer means interconnecting said driver and receiver means and said display means for (1) writing logic commands to said driver and receiver means for controlling the generating of the series of square-wave, double-duty cycle voltage signals used for placing address and command information on said bus; (2) reading the current signals indicative of the status of the commanded element; (3) establishing a history of performance of each of the commanded elements; and (4) transferring updated status information to said display means.

4,920,533
CATV SUBSCRIBER TERMINAL TRANSMISSION CONTROL

Michel Dufresne, Boucherville; Samir Sammoun, Brossard; Dave Gregory, Calgary; Jean-Paul Champagne, Brossard; Alain Tessier, Piedmont; Pierre Scott, and Francois Methot, both of Montreal, all of Canada, assignors to Videotron LTEE, Montreal, Canada

Filed Oct. 26, 1988, Ser. No. 262,802
Claims priority, application Canada, Nov. 2, 1987, 550764
Int. Cl.[5] H04N 7/08
U.S. Cl. 370—85.2 30 Claims



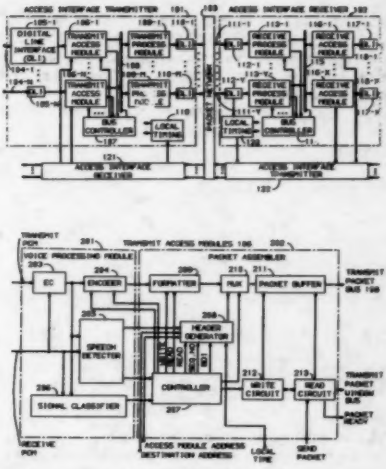
1. A bidirectional cable communication system comprising:
(a) a head end,
(b) a bidirectional transmission network connected to the head end for transmitting signals downstream from the head end to a plurality of subscriber stations and for transmitting data signals upstream to the head end from the subscriber stations,
(c) means at the head end for detecting collisions between signals received from the subscriber stations and for generating a collision signal,
(d) means at the head end for transmitting downstream on the transmission, network status bits of data signals indicative of said collision, whereby upon detection thereof by a subscriber station it can be enabled to cease transmission.

4,920,534
SYSTEM FOR CONTROLLABLY ELIMINATING BITS FROM PACKET INFORMATION FIELD BASED ON INDICATOR IN HEADER AND AMOUNT OF DATA IN PACKET BUFFER

Harry W. Adelmann, Neptune, and James D. Tomcik, Aberdeen, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 28, 1986, Ser. No. 834,904
Int. Cl.[5] H04L 11/20
U.S. Cl. 370—94.1 9 Claims

1. Apparatus for use in an arrangement for transmitting packets, each of the packets having a header and an information field including a plurality of bits, comprising,
a field in the header of each current packet including a bit elimination indicator indicating whether or not bits may be eliminated from the current packet information field,
buffer storage means for storing bits of currently supplied packets,
means for determining the amount of packet bits presently stored in said buffer storage means,
means for comparing an amount of packet bits presently stored in said buffer storage means to predetermined threshold levels to generate bit elimination control signals, and
means responsive to said bit elimination control signals and to said bit elimination indicator for controllably eliminating bits from the packet information field of a current packet being supplied to said buffer storage means, if

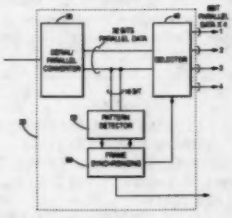


necessary, wherein the length of said packet is shortened, if necessary.

4,920,535
DEMULTIPLEXER SYSTEM

Toshiaki Watanabe, Kawasaki; Kazuo Iguchi, Yokohama; Tetsuo Soejima, Tokyo, and Shinji Obta, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 14, 1988, Ser. No. 284,395
Claims priority, application Japan, Dec. 14, 1987, 62-315821
Int. Cl.[5] H04J 3/06
U.S. Cl. 370—105.1 9 Claims



8. A demultiplexer system for demultiplexing frames including frame bytes, comprising:
converting means for receiving and converting serial multiplexed frame bytes into parallel multiplexed frame bytes;
frame synchronization means for simultaneously detecting a predetermined frame synchronization pattern and a prede-

termined byte within said frame synchronization pattern; and

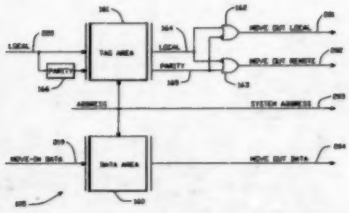
selector means for arranging the frames based on said predetermined byte.

4,920,536

ERROR RECOVERY SCHEME FOR DESTAGING CACHE DATA IN A MULTI-MEMORY SYSTEM

Gary N. Hammond; Michael D. Taylor, and Nongnuch Taylor, all of San Jose, Calif., assignors to Amdahl Corporation, Sunnyvale, Calif.

Filed Oct. 14, 1988, Ser. No. 258,202
Int. Cl.[5] G06F *11/10, 11/16*
U.S. Cl. 371—10.1 **16 Claims**



1. A data processing system, comprising:

at least a first memory facility and a second memory facility;

a processor connected to the memory facilities addressing data in the first memory facility and the second memory facility by a system address, wherein the processor includes:

a cache for storing data staged from the memory facilities, including means for storing the system addresses of the data staged and means for storing indicators which identify the memory facilities from which the data is staged;

means coupled to the cache for detecting errors in an indicator during a destaging operation;

means coupled to the cache for destaging data and addresses to a memory facility identified by the corresponding indicator if no error in the indicator is detected;

means coupled to the cache for destaging data and the corresponding system address to each of the memory facilities if an error is detected in a corresponding indicator; and the each of said memory facilities includes:

means for receiving the system addresses and data destaged from the processor, including means for checking system addresses destaged from the processor to determine to which memory facility the corresponding destaged data belongs.

4,920,537

METHOD AND APPARATUS FOR NON-INTRUSIVE BIT ERROR RATE TESTING

Andrew S. Darling, 10725 Santa Anita Terrace, Damascus, Md. 20872, and Mark R. Testardi, 17128 King James Way #202, Gaithersburg, Md. 20877

Filed Jul. 5, 1988, Ser. No. 215,394
Int. Cl.[5] G06F *11/00*
U.S. Cl. 371—5.1 **11 Claims**

1. A method of measuring a bit error rate of a data stream in a digital communications circuit comprising the steps of:

repeatedly intermittently sampling data bits in the data stream according to a sampling algorithm at upstream and downstream monitor points to produce upstream and downstream sets of sampled data bits;

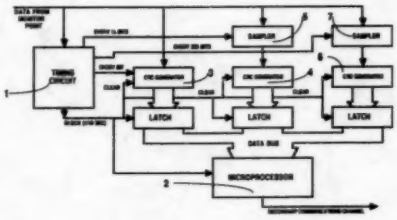
dividing the upstream set of sampled data bits into upstream blocks of predetermined block size;

computing upstream block check codes on the upstream blocks;

dividing the downstream set of sampled data bits into downstream blocks of predetermined block size;

computing downstream block check codes on the downstream blocks;

synchronizing the sampling of the data bits at the upstream and downstream monitor points, the dividing of the upstream and downstream sets of sampled data bits into the upstream and downstream blocks, and the computing of the upstream and downstream block check codes in order to ensure that the upstream block check codes are computed on the upstream blocks that are made up of the data bits that represent the same positions in the data stream as the data bits that make up the downstream blocks on which the downstream block check codes are computed;



comparing the upstream block check codes that are computed on the upstream blocks that are made up of the data bits that represent the same positions in the data stream as the data bits that make up the downstream blocks on which the downstream block check codes are computed and the downstream block check codes with each other to determined a number of miscompares; and

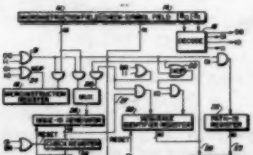
determing a bit error rate or a quantity representative thereof based on the number of miscompares.

4,920,538

METHOD OF CHECKING THE EXECUTION OF MICROCODE SEQUENCES

Joni N. Chan, Los Altos Hills, and Andrew Moy, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 28, 1985, Ser. No. 750,346
Int. Cl.[5] G06F *11/00*
U.S. Cl. 371—19 **6 Claims**



1. A method for detecting impermissible traversals in a system in which selective traversals (jumps or branches) along extents of the symbol string are dictated by embedded pointers, and further in which the symbol string includes single entrance, single exit (SESE) substrings, comprising the steps of:

(a) processing the symbol string by:

(1) deriving the labeling ones of a set of permissible traversals from the SESE substrings;

(2) generating a global label indicative of one permissible traversal through the symbol string of the set of permissible traversals and then scaling the labels obtained in step (a1) of remaining ones of the set of permissible traversals such that transitioning along a permissible traversal always yields the same global label;

(3) embedding the labels within SESE substrings;

(b) executing the processed symbol string by:

(4) reading the SESE substrings from a boundary (entrance/exit) of an arbitrary substring to a boundary of another arbitrary substring and computing from each read substring at least one label indicative of the traversal; and

(5) comprising the embedded label with computed label such that a mismatch is indicative of error.

4,920,539

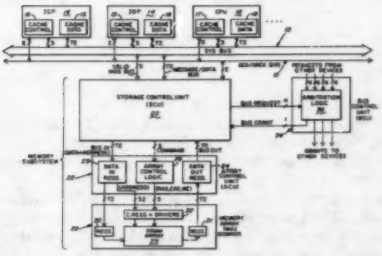
MEMORY ERROR CORRECTION SYSTEM

David Albonesi, Hudson, Mass., assignor to Prime Computer, Inc., Natick, Mass.

Filed Jun. 20, 1988, Ser. No. 209,285

Int. Cl.[5] G06F *11/10*

U.S. Cl. 371—40.2 **42 Claims**



1. In a computer system having a processing unit, memory, memory control unit, system communication bus, and bus control unit, a method of correcting memory errors, comprising the steps of, detecting a data error while data is being transferred from memory to the system bus and generating corresponding corrected data if a data error is detected, storing at the memory control unit at least the address field and source identification code associated with the just detected data error, generating a bus request signal coupled to the bus control unit, said bus control unit, in turn, generating a bus grant signal, said memory control unit in response to said bus grant signal issuing a read message on the system bus having an address field and destination identification code corresponding to said stored address field and source identification code, and in response to said read message, the device indicated by said identification code, writing back to memory the correct data corresponding to said address field.

4,920,540

FAULT-TOLERANT DIGITAL TIMING APPARATUS AND METHOD

Kurt F. Baty, Medway, Mass., assignor to Stratus Computer, Inc., Marlboro, Mass.

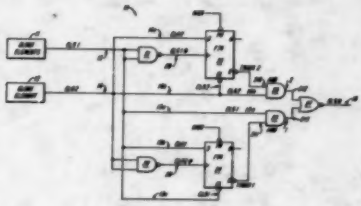
Filed Feb. 25, 1987, Ser. No. 18,629

Int. Cl.[5] G06F *1/04, 11/20*; H04Q *3/54*

U.S. Cl. 371—61 **2 Claims**

2. Computer timing apparatus for producing a single stream of timing pulses continually when at least any one of first and second input sequences of timing signals are present, said apparatus comprising

A. multi-stable binary logic means for receiving said first and second input sequences of timing signals and for producing, in response thereto, first and second sequences of clock-tracking signals, each sequence of clock-tracking signals being responsive to occurrence of a transition in at least one input sequence of timing signals, and



B. output logic means for logically combining each input sequence of timing signals with its corresponding clock-tracking signal to generate a corresponding resultant signal, and for logically combining the resultant signals to produce a single stream of output signals responsive to a next transition in any of said first and second input sequences of timing signals.

4,920,541

APPARATUS FOR GENERATING VARIOUS LASER WAVELENGTHS FROM THE SAME LASER MEDIUM

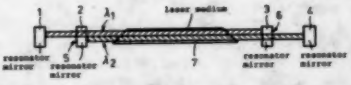
Reinhold Baumgartner, Freising; Hans Lenz, Munich; Herbert Stepp, Gräfelfing, and Eberhard Unsöld, Oberschleissheim, all of Fed. Rep. of Germany, assignors to Gesellschaft für Strahlenund Umweltforschung mbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 155,593, Feb. 12, 1988, abandoned. This application May 25, 1989, Ser. No. 357,654

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1987, 3704338

Int. Cl.[5] H01S *3/10*

U.S. Cl. 372—23 **12 Claims**

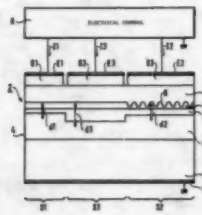


1. In a laser device for producing laser light outputs having various groups of laser wavelengths from a same laser medium with the use of resonator mirrors, the laser device having a laser cavity and resonator mirrors, the laser medium being disposed in the cavity, two of the resonator mirrors being end resonators disposed at opposite ends of the cavity on opposite sides of the laser medium, the improvement wherein the resonator mirrors include at least four resonator mirrors linearly arranged outside of the laser medium, two of which are the end resonator mirrors and at least two of which are disposed between the end resonator mirrors and serve as respective resonator boundaries for respective ones of the various groups of laser wavelengths and constitute respective intracavity elements for the other of the various groups of laser wavelengths, transmitting the others of the various groups of laser wavelengths therethrough, the device further comprising means for at least one of switching and regulating the intensity of the wavelength groups, said means including means for tilting said two end resonator mirrors.

4,920,542
TUNABLE SEMICONDUCTOR LASER

Philippe Brosson, Forges Les Bains; Joël Jacquet, Orsay; Claude Artigue, Paris; Denis Leclerc, Bourg La Reine, and Jacques Benoit, Orsay, all of France, assignors to Alcatel N.V., Amsterdam, Netherlands

Filed Mar. 22, 1989, Ser. No. 351,893
Claims priority, application France, Nov. 25, 1988, 88 15467
Int. Cl.[5] H01S 3/19
U.S. Cl. 372—50 **10 Claims**

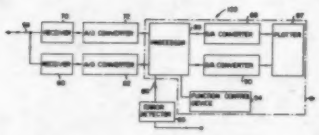


1. An improved tunable semiconductor laser comprising:
a monolithic semiconductor wafer made up of layers (C1, C2, C3, C4) whose thicknesses are superposed in a superposition direction, said layers extending and/or following one another in a longitudinal direction and in a transverse direction and constituting an internal longitudinal light guide (C2, C3) between confinement layers (C1, C4) having lower refractive indices in order to guide a light beam to be emitted, said light guide comprising:
an active layer (C2) having a forbidden energy band which is narrower than in the adjacent layers (C1, C3), and
a grating layer (C3),
first and second ones of said confinement layers (C1, C4) having opposite conductivity types so that electrical injection currents passing from one of said first and second confinement layers to the other pass through said light guide, injecting free carriers therein and consequently modifying its optical gain and its refractive index;
three sections of said plate following one another in said longitudinal direction as follows:
an amplification section (S1) in which the thickness of said act .ve layer is suitable for amplifying said light and constitutes an amplification thickness;
a phase tuning section (S3); and
a grating section (S2) which is situated at a first end of said plate and in which the thickness of said grating layer (C3) varies in alternation at a grating pitch along said longitudinal direction, thereby forming a distributed Bragg reflector grating (R) having an equivalent pitch for said light, said equivalent pitch being controllable by controlling the refractive index of a control layer (C2) of said light guide in said grating section;
said laser also comprising:
amplification electrodes (E1, EC) for injecting one of said injection currents into said amplification section, said current being an amplification current and being suitable for causing positive optical gain for said light to appear in said active layer;
phase tuning electrodes (E3, EC) for injecting one of said injection currents into said phase tuning section (S3), said current being a phase tuning current and being suitable for controlling the refractive index of said control layer (C2), thereby controlling the optical length for said light of said phase tuning section;
grating control electrodes (E2, EC) for injecting one of said injection currents into said grating section, said current being a grating control current suitable for controlling said equivalent pitch of said distributed reflector (R); and
a second reflector (4) at a second end of said plate in order to constitute a laser oscillator suitable for emitting said light, thereby enabling a central frequency of said light to be controlled by the value of said grating control current and enabling stable monomode operation of said laser oscillator to be obtained by controlling said phase tuning current;
improvement whereby said active layer (C2) extends over at least one of said phase tuning section (S3) and said grating section (S2) in such a manner as to constitute said control layer therein, thereby widening the tuning range and/or reducing the spectrum line width of said laser.

4,920,543
CHARACTERIZATION OF DIGITAL RADIO SIGNALS

Andrew L. Martin, Ferny Creek, Australia, assignor to Australian Telecommunication Corporation, Melborne, Australia

Division of Ser. No. 829,150, Feb. 24, 1986, Pat. No. 4,766,600.
This application May 25, 1988, Ser. No. 198,459
Claims priority, application Australia, May 15, 1984, PG4999; Dec. 24, 1984, PG8701
Int. Cl.[5] H04B 17/00
U.S. Cl. 375—10 **16 Claims**



8. A method of characterising the performance of a digital microwave receiver connected to receive and demodulate a digitally modulated microwave carrier signal which may be subject to distortion due to multipath fading, said method comprising the steps of:
detecting and monitoring the error rate in the signal as received and demodulated by the receiver under test,
when said error rate lies between predetermined limits,
repetitively measuring at time-spaced intervals during a test period the level and sign of the amplitude dispersion of the signal as received, and
accumulating first counts of the number of times that said dispersion measurement fall within each one of a series of ranges of possible dispersion levels, both positive and negative, and
displaying said first count against measurement range for both positive and negative dispersion levels.

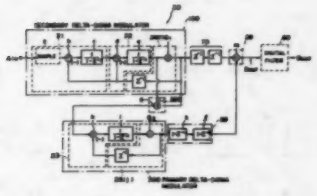
4,920,544
DELTA-SIGMA MODULATOR

Seiji Endo, Kawasaki; Osamu Kobayashi, Yokohama, and Masatsugu Kamimura, Kobe, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 10, 1989, Ser. No. 308,555
Claims priority, application Japan, Feb. 10, 1988, 63-29291
Int. Cl.[5] H04B 14/04
U.S. Cl. 375—26 **11 Claims**

1. A delta-sigma modulator comprising:
secondary delta-sigma modulation means for carrying out a secondary delta-sigma modulation for an analog input signal, thereby producing a first quantization signal;
quantization noise extracting means for extracting a quantization noise occurring in said secondary delta-sigma modulation means;
primary delta-sigma modulation means for carrying out a first delta-sigma modulation for said quantization noise, thereby producing a second quantization signal;
differentiating means for differentiating said second quantization signal supplied from said primary delta-sigma modulation means; and

adding means for adding said first quantization signal and an output signal of said differentiating means, thereby producing a digital output signal corresponding to said analog input signal.



4,920,545

METHOD AND APPARATUS FOR TRANSMITTING A SYNCHRONOUS DATA SIGNAL ON A TRANSMISSION MEDIUM ON WHICH THE TRANSMISSION RATE IS GREATER THAN THE DATA SIGNAL BIT RATE

Gunnar S. Forsberg, Stockholm, and Stefan E. Josefsson, Hägersten, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

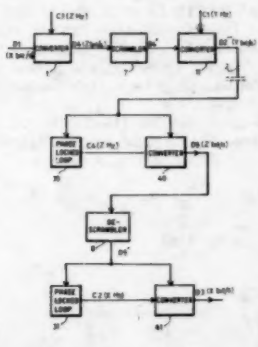
PCT No. PCT/SE88/00100, § 371 Date Nov. 14, 1988, § 102(e) Date Nov. 14, 1988, PCT Pub. No. WO88/07301, PCT Pub. Date Sep. 22, 1988

PCT Filed Mar. 3, 1988, Ser. No. 275,052

Claims priority, application Sweden, Mar. 11, 1987, 8701013-8

Int. Cl.[5] H04B *15/00*

U.S. Cl. 375—58 8 Claims



1. Method of transmitting a synchronous data signal on a transmission medium on which the transmission rate is greater than the data signal bit rate, which includes the steps of, oversampling the data signal in a transmitter with a sampling frequency which is equal to the transmission rate on the transmission medium, transmitting the data signal on the transmission medium, generating a clock signal in a receiver such that the clock signal is phase-locked to the transmitted data signal and has a frequency which is substantially equal to the bit rate of the original synchronous data signal, and resampling the transmitted data signal with the clock signal formed in the receiver, wherein the improvement comprises the step of: modifying the synchronous data signal in the transmitter such that an uneven distribution of the transmitted data signal's edge positions in relation to their mean positions is avoided, whereby incorrect locking-in of the clock signal formed in the receiver is avoided.

4,920,546

FRAME SYNCHRONIZING APPARATUS

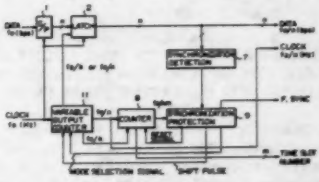
Kazuo Iguchi, Yokohama; Tetsuo Soejima, Tama; Kazuo Murano, Shibuya; Shigeo Amemiya, Yokohama; Hiroaki Komine; Toshiaki Watanabe, both of Kawasaki, and Tomohiro Shinomiya, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 31, 1988, Ser. No. 176,294

Claims priority, application Japan, Mar. 31, 1987, 62-078168; Mar. 31, 1987, 62-078169

Int. Cl.[5] H04L *7/00*

U.S. Cl. 375—106 18 Claims



1. A frame synchronizing apparatus in a receiving apparatus for receiving digital signals for PCM communication, said digital signals including serial signals at a rate of f_0 bits per second (bps), said serial signals including a frame synchronizing signal with n bits or a part of the frame synchronizing signal, collectively arranged in one frame, said frame synchronizing apparatus comprising:

latching means for converting said serial signals into parallel signals and for latching said parallel signals in response to a latch timing pulse;

synchronization detecting means for detecting said frame synchronizing signal from said parallel signals;

latch timing signal generating means for generating said latch timing pulse at a rate of f_0/k (bps) where $1<k<n$, so that said latching means latches said parallel signals a plurality of times while receiving a frame of said digital signals; and

phase shifting means for changing the rate of said latch timing pulse in response to said synchronization detecting means not detecting said frame synchronizing signal while receiving said frame.

4,920,547

STUFF SYNCHRONIZATION CIRCUIT

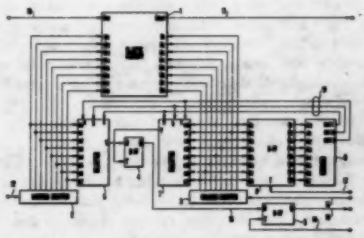
Kurenai Murakami, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Dec. 1, 1987, Ser. No. 127,498

Claims priority, application Japan, Dec. 2, 1986, 61-287448

Int. Cl.[5] H04L *7/00*

U.S. Cl. 375—112 10 Claims



1. A stuff synchronization circuit comprising:

a memory in which writing and reading are performed at different timings;

phase comparison means for detecting a phase difference between a write timing for a specific bit included in data input to said memory and a read timing for the specific bit;

stuff judgment means for judging an insertion timing of stuff pulses on the basis of the detected phase difference;

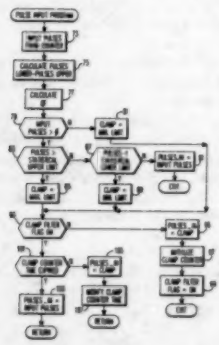
and control means for keeping a time interval between a time at which the phase difference is detected by said phase comparison means and a time at which the insertion timing of stuff pulses is judged by said stuff judgment means constant.

4,920,548

SOURCE RANGE NEUTRON FLUX COUNT RATE SYSTEM INCORPORATING METHOD AND APPARATUS FOR ELIMINATING NOISE FROM PULSE SIGNAL

Louis W. Gaussa, Jr., Penn Township, Westmoreland County; Kingsley F. Graham, Murrysville; John B. Lipchak, Forest Hills, and Lesley Greenberg, Monroeville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 28, 1988, Ser. No. 250,471
Int. Cl.[5] G21C *17/00*
U.S. Cl. 376—255 **20 Claims**



1. Apparatus for generating nuclear reactor source level neutron pulse count rates selectively filtered to reduce frequency burst noise, said apparatus comprising:

detector means generating a pulse signal representative of neutron emissions and containing frequency burst noise;

pulse count rate signal generating means repetitively generating a pulse count rate signal from said pulse signal representative of pulses counted in a time interval of selected duration, with the pulse count rate signal for the most recent interval being the current pulse count rate signal;

pulse count rate signal limit generating means generating from previous values of said pulse count rate signal a statistical limit inside of which said current pulse count rate signal should statistically remain within a preselected probability;

comparison means comparing said current pulse count rate signal with said statistical limit; and

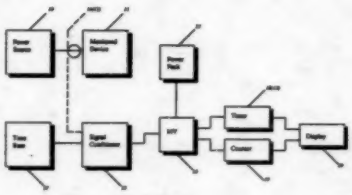
output generating means including means generating a selectively filtered pulse count rate signal having a value of said current pulse count rate signal when said current pulse count rate signal is inside of said statistical limit and clamping means clamping said selectively filtered pulse count rate signal to said statistical limit when said current pulse count rate signal is outside said statistical limit.

4,920,549

TIME DEMAND COUNTER

John Dinovo, 4026 W. St. John, Glendale, Ariz. 85308

Filed Feb. 8, 1988, Ser. No. 153,260
Int. Cl.[5] G07C *5/02, 3/02*
U.S. Cl. 377—16 **20 Claims**



1. In a time demand counter having

current sensing means for detecting, by current flow, the actuation of a device being monitored;

timing means for timing and accumulating a record of total elapsed time of actuation of a device being monitored; and

actuating means coupling said sensing means and said timing means for actuating said timing means when the device being monitored it itself activated and for dectuating said timing means when the device being monitored is not activated;

the improvement wherein:

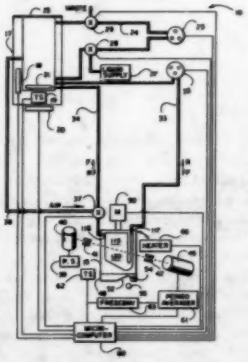
said current sensing means is a nonloading device so as to cause insignificant loading on the operation of a device being monitored.

4,920,550

X-RAY PARTICLE SIZE ANALYZER

James P. Olivier, Lawrenceville; Mary F. Kane, Atlanta; Clyde Orr, Jr., Dunwoody; Charles L. Laughinghouse, Stone Mountain; Jack J. Wagner, Dunwoody, and Samuel V. Tidwell, Norcross, all of Ga., assignors to Micromeritics Instrument Corporation, Norcross, Ga.

Continuation-in-part of Ser. No. 115,499, Oct. 30, 1987. This application Nov. 25, 1987, Ser. No. 125,395
Int. Cl.[5] G01N *23/06*
U.S. Cl. 378—51 **29 Claims**



1. A method of acquiring information relating to the distribution of particle sizes in a sample undergoing sedimentation in a suspension of said sample in a fluid medium contained in a

sample cell, while passing an x-ray beam from a single x-ray source mounted for movement relative to said cell through said suspension of said sample, comprising the steps of:

(a) moving one of said cell and said x-ray source to aim said x-ray beam at a first predetermined location along said cell spaced apart from the location at which said x-ray source is aimed at the start of sedimentation;

(b) waiting at said predetermined location until one or more selected times after the beginning of sedimentation; and

(c) while relative movement of said cell and said x-ray source is stopped, measuring and recording the transmittance of x-rays through said cell containing said suspension of said one or more selected times.

4,920,551

ROTATING ANODE X-RAY TUBE

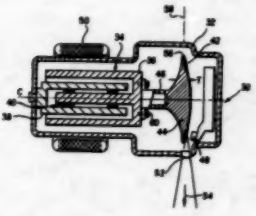
Hiroshi Takahashi and Kenichi Takahara, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Continuation of Ser. No. 912,911, Sep. 29, 1986, abandoned. This application May 9, 1989, Ser. No. 349,927

Claims priority, application Japan, Sep. 30, 1985, 60-216581

Int. Cl.[5] H01J *35/26*

U.S. Cl. 378—125 **5 Claims**



1. A rotating anode x-ray tube comprising:

a vacuum housing;

an anode support shaft located at least in part inside said housing;

means for rotating said support shaft;

a ring-shaped target which generates x-rays in response to thermion bombardment;

an anode disk having a central axis of rotation and a circumferential peripheral edge lying in a plane perpendicular to said axis of rotation, said target mounted to said disk adjacent said peripheral edge, said disk including means, formed as a solid unitary structure with said disk and remote from said peripheral edge, for mounting said disk to said support shaft within said housing to permit rotation of said disk about said axis of rotation, said means for mounting located inside and remote from said ring-shaped target to leave a portion of said disk between said target and said means for mounting, said disk formed as a solid unitary structure along said plane, including that portion of said disk coincident with said axis of rotation, and said disk having a thickness which increases exponentially radially inward from said peripheral edge of said disk to said means for mounting at a rate sufficient to equalize stress radially within said disk upon rotation of said support shaft; and

means for bombarding said target with thermions to generate said x-rays.

4,920,552

X-RAY APPARATUS COMPRISING AN ADJUSTABLE SLIT-SHAPED COLLIMATOR

Joannes L. G. Hermens, Hoensbroek, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 16, 1989, Ser. No. 324,380

Claims priority, application Netherlands, Mar. 24, 1988, 8800738

Int. Cl.[5] G21K *1/04*

U.S. Cl. 378—153 **20 Claims**

1. An X-ray apparatus, comprising an X-ray source for generating an X-ray beam for irradiating an object space, detection means for detecting X-rays from said source having passed through the object space, and a collimator which is positioned between the X-ray source and the object space in order to collimate the X-ray beam so as to obtain a fan-shaped beam of adjustable thickness for irradiating said object space, wherein the collimator comprises a pair of opposed collimator slats which are pivotable about parallel axes, each slat extending from the axis about which said slat is pivotable to a free end of said slat remote from said axis for intercepting any portions of said X-ray beam lying outside a slit aperture of desired width determining the beam thickness, each slat carrying at its free end an X-ray absorbing bar, the bars carried by the slats having respective opposed smooth arcuate surfaces for defining between the bars the width of said slit aperture, and means for angularly positioning said collimator slats about said axes.

4,920,553

FILM FEEDER OF A CASSETTELESS X-RAY PHOTOGRAPHIC APPARATUS

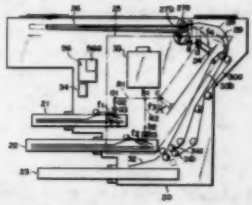
Shigeru Sasaki, and Hisashi Sakakibara, both of Ootawara, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 27,130, Mar. 16, 1987, abandoned, which is a continuation of Ser. No. 583,228, Feb. 24, 1984, abandoned. This application Jun. 2, 1988, Ser. No. 205,035

Claims priority, application Japan, Feb. 26, 1983, 58-31590

Int. Cl.[5] G03B *42/04*

U.S. Cl. 378—173 **10 Claims**



1. A film feeder of a cassetteless x-ray photographic apparatus, comprising:

a frame;

at least first and second magazines for respectively storing a plurality of unexposed films of first and second sizes;

a recovery magazine for storing exposed films;

a holder movable between first and second positions for

holding an unexposed film therein, the holder having an end for insertion of the unexposed film into the holder when the holder is in the first position, the exposed film in the holder being positioned for exposure with the holder in the second position, and after exposure the film being supported for discharge from the holder at said end thereof with the holder in the first position;

a common suction means of picking up and holding one of the unexposed films stored in the first and second magazines;

a first guide path extending to said first position from the first and second magazines;

film return guide path extending to the recovery magazine from said first position, the second guide path being different from the first guide path;

a driving means for moving the suction holding the unexposed film in vertical and horizontal directions, rotating the suction means, and moving the suction means to said first position of said holder along the first guide path; and

a return mechanism for transporting the exposed film along said film return guide path to the recovery magazine from said first position.

4,920,554

COMPACT TYPE X-RAY EMITTER

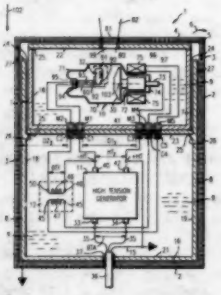
Emile Gabbay, and Jacques Le Guen, both of Paris, France, assignors to General Electric CGR SA, Paris, France

Filed Oct. 28, 1988, Ser. No. 263,898

Claims priority, application France, Oct. 30, 1987, 87 15054

Int. Cl.[5] H01J *35/10*

U.S. Cl. 378—200 **10 Claims**



1. An X-ray emitting device of the X-ray unit type, comprising:

a metallic casing, said casing containing an X-ray tube and a power supply means to supply the X-ray tube with high voltage and low voltage,

said X-ray tube and said supply means are respectively immersed in separate electrically insulating fluids, wherein

the X-ray tube and the supply means are respectively contained in first and second imperviously sealed chambers and which are detachable electrically connected with each other, with said two chambers being entirely or partially made of an electrically insulating material.

4,920,555

COMPACT TELEPHONE LINE TEST APPARATUS

Daryl E. Ingalsbe, Blair, Nebr., assignor to Independent Technologies, Inc., Omaha, Nebr.

Filed Sep. 27, 1988, Ser. No. 249,825

Int. Cl.[5] H04M *1/24;* **H04B** *3/46*

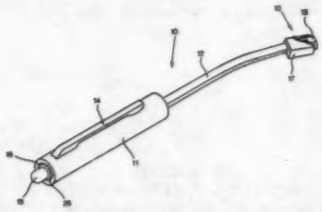
U.S. Cl. 379—21 **17 Claims**

1. A compact telephone line test apparatus to determine the operative status of a telephone line having a modular connector comprising:

(a) a housing structure having a hollow interior and opposing first and second apertured ends;

(b) a tri-state light emitting diode of a predetermined length having predetermined activation states and being partially disposed within said housing structure and through said first aperture along its length so that it extends to the exterior of said housing structure to provide a wide angle viewing perspective;

(c) current limiting means disposed within said housing structure interior;



(d) a printed circuit board to electrically connect in series, said light emitting diode and said current limiting means, said printed circuit board being fixed within said housing structure and engaged by said housing structure interior so that it maintains said light emitting diode in said extended position; and

(e) modular connection means being communicatively connected to said printed circuit board and extending from said second aperture of said housing structure whereby said tri-state light emitting diode visually indicated the operative status of the telephone line when said modular connection means is connected to the telephone line.

4,920,556

TELEPHONE WITH BUILT-IN EMERGENCY PANIC SWITCH, LONG DISTANCE TOLL TIMER AND MUSIC ON HOLD CARDS

Keith K. Wong, 15 Wilderness Trail, Warren, N.J. 07060

Filed Feb. 13, 1989, Ser. No. 309,497

Int. Cl.[5] H04M *1/21, 1/27, 11/04, 15/00*

U.S. Cl. 379—51 **10 Claims**

1. A telephone comprising one, two, or, all of the following:

a timer circuit to save long distance tolls;

a panic switch to activate a circuit to automatically call multiple numbers and to broadcast an emergency message;

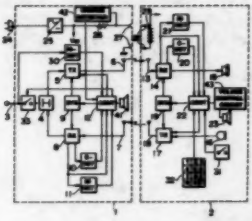
a means to allow the phone user to play different music recordings when the phone is on HOLD by plugging in different music generator cards.

4,920,557

RADIO COMMUNICATION APPARATUS

Yuji Umemoto, Hino, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 13, 1988, Ser. No. 243,751
Claims priority, application Japan, Sep. 14, 1987, 62-230232
Int. Cl.[5] H04Q 7/04
U.S. Cl. 379—61 9 Claims



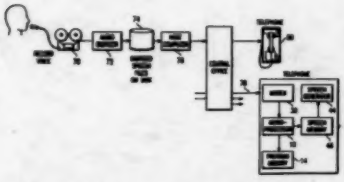
1. A radio communication apparatus comprising:
a base unit connected to a communication line;
a radio terminal unit driven by a battery and connected to the base unit via a radio circuit;
a speaker provided at the base unit for generating a ring tone when there is an incoming signal from the communication line;
means for detecting physical connection of the radio terminal unit to the base unit to charge the battery of the terminal unit; and
control means for causing the speaker to generate a ring tone when there is an incoming signal from the communication line in a state where the radio terminal unit is physically connected to the base unit for charging the battery, and causing the radio terminal unit to generate a ring tone for a predetermined time when there is an incoming signal from the communication line in a non-charging state in which the radio terminal unit is not physically connected to the base unit.

4,920,558

METHOD AND APPARATUS FOR DOWNLOADING SPEECH FILES

John A. Hird, Dallas; Lindsey D. Owen, and Michael R. Rice, both of Carrollton, all of Tex., assignors to Intellicall, Inc., Carrollton, Tex.

Filed Jan. 23, 1989, Ser. No. 300,835
Int. Cl.[5] H04M 17/00
U.S. Cl. 379—67 21 Claims



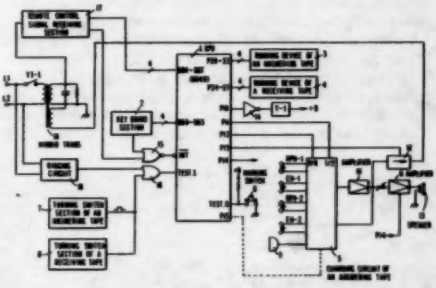
1. A system for programming a local telecommunications device for use with a telecommunications network comprising:
prompts to be used by the telecommunications device to inform a user of the telecommunications device and a called party;
a formatting device for organizing said prompts into a formatted file;
a transmitter for transmitting said formatted file to the telecommunications device over the telecommunications network; and
a message memory resident in the telecommunications device for storing said formatted file such that said prompts may be selectively converted into messages and used to inform the user of the telecommunications device and the called party during the completion of telephone calls from telecommunications device.

4,920,559

TELEPHONE ANSWERING DEVICE WITH REMOTE CONTROL TIMING MARK

Kazuo Hashimoto, Tokyo, Japan, assignor to Hashimoto Corporation, Tokyo, Japan

Filed Dec. 28, 1987, Ser. No. 138,897
Claims priority, application Japan, Dec. 27, 1986, 61-310669
Int. Cl.[5] H04M 1/65
U.S. Cl. 379—74 5 Claims



1. A telephone answering device, comprising:
means for recording an outgoing message on an outgoing message recording medium;
means for confirming the outgoing message;
a switch for a marking signal which is momentarily turned on during said outgoing message confirming operation;
means for storing into a first memory means a first marking position on the outgoing message recording medium where said marking switch is turned on during announcement of a specific word which is known only to a user of the device;
means for storing into a second memory means a second marking position on the outgoing message recording medium where said marking switch is released;
means for setting the device to the standby mode after said marking positions are stored;
means for engaging the telephone line in response to a ringing signal which arrives in the standby mode, and for playing back said outgoing message to send out; and
means for enabling a remote retrieval of an incoming message recording medium in response to a remote control signal which arrives between said first marking position and said second marking position during the playback of said outgoing message.

4,920,560

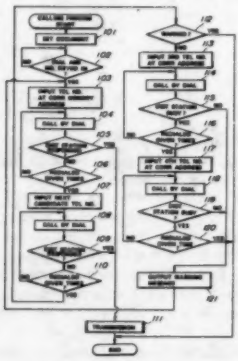
METHOD OF AUTOMATIC DIALING AND AUTOMATIC DIALING DEVICE FOR FACSIMILE APPARATUSES

Kenichi Kageyama, Hino, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 18, 1988, Ser. No. 156,888
Claims priority, application Japan, Feb. 18, 1987, 62-21296[U]
Int. Cl.[5] H04M 11/00; H04N 1/32
U.S. Cl. 379—100 2 Claims

1. A method of automatic dialing for facsimile apparatuses, comprising the steps of:

registering, in a memory, a plurality of abbreviated numbers;
storing, in said memory, telephone numbers of a first and second facsimile apparatus of a receiving side, of a predetermined receiving side telephone set, and of a predetermined calling side telephone set, for each of the plurality of abbreviated numbers;
selecting one of the stored abbreviated numbers coinciding with an input abbreviated number;
reading four telephone numbers corresponding to the selected abbreviated number, said four telephone numbers including said telephone numbers of the receiving side's first facsimile apparatus, of the receiving side's second facsimile apparatus, of the receiving side telephone set, and of the calling side telephone set;
first, automatically dialing the corresponding telephone number of the receiving side's first facsimile apparatus and confirming a response thereto;
transmitting predetermined picture image data to the receiving side's first facsimile apparatus when a response is received at the first automatically dialing step;
second, automatically dialing the corresponding telephone number of the receiving side's second facsimile apparatus and confirming a response thereto when no response is received at the first automatically dialing step;
transmitting predetermined picture image data to the receiving side's second facsimile apparatus when a response is received at the second automatically dialing step;



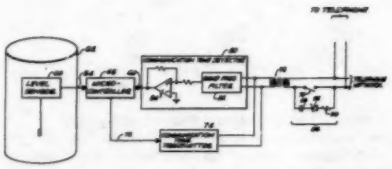
third, automatically dialing the corresponding telephone number of the receiving side telephone set and confirming a response thereto when no response is received at the second automatically dialing step;
transmitting to the receiving side telephone set a first voice message indicative of an abnormality at the receiving side's first and second facsimile apparatuses when a response is received at the third automatically dialing step;
fourth, automatically redialing, after the voice message transmission step, the corresponding telephone number of the receiving side's first facsimile apparatus and confirming a response thereto;
transmitting predetermined picture image data to the receiving side's first facsimile apparatus when a response is received at the fourth automatically redialing step;
fifth, automatically redialing the corresponding telephone number of the receiving side's second facsimile apparatus and of confirming a response thereto, when no response is received at the fourth automatically redialing step;
transmitting predetermined picture image data to the receiving side's second facsimile apparatus when a response is received at the fifth automatically redialing step;
sixth, automatically dialing the corresponding telephone number of the calling side telephone set and confirming a response thereto, when no response is received at the third automatically dialing step; and
transmitting to the calling side telephone set a second voice message indicative of an abnormal facsimile communication when a response is received at the sixth automatically dialing step.

4,920,561

RING DETECTOR FOR TELEPHONE LINE

Andrew C. Mitchell, Chelmsford, Mass., assignor to Scully Signal Company, Wilmington, Mass.

Filed Oct. 28, 1988, Ser. No. 263,716
Int. Cl.[5] H04M *1/00*
U.S. Cl. 379—106 **20 Claims**



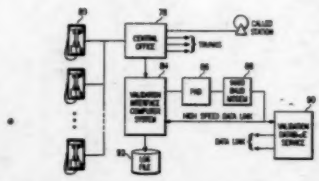
1. In a communication device for receiving information over a telephone line, said device having receiver circuitry for receiving information having frequencies within the telephone voice band and extracting data therefrom, an apparatus for detecting incoming ring signals and outgoing pulse dial signals on said telephone line, said apparatus comprising:
means responsive to said incoming ring signals and to said outgoing pulse dial signals for generating intermediate signals having frequencies within said telephone voice band;
means for providing said intermediate signals directly to said receiver circuitry so that said receiver circuitry can extract ringing and dialing data therefrom; and
means responsive to said ringing and dialing data for detecting incoming ring signals and outgoing dial pulses on said telephone line.

4,920,562

AUTOMATIC GENERATION OF BILLING RECORDS AT A TELEPHONE PAYSTATION

John A. Hird, Dallas; Lindsey D. Owen, and Michael R. Rice, both of Carrollton, all of Tex., assignors to Intellicall, Inc., Carrollton, Tex.

Filed Jan. 23, 1989, Ser. No. 300,828
Int. Cl.[5] H04M *15/30, 17/02*
U.S. Cl. 379—132 **35 Claims**



1. A telecommunications system for processing a telephone call made by a user of the system, comprising:
a pay telephone station;
circuitry at said station for creating and storing a billing record associated with the call containing information relating to the identity of an appropriate party to be billed for the call and information relating to a rate to be charged

for the call and a chargeable amount of time for the call; and

circuitry for transferring the billing record from said station to a storage unit to enable the subsequent billing of charges associated with the call to said appropriate party.

4,920,563

CIRCUIT COMPENSATING FOR THE ATTENUATION OF A NOTCH FILTER AT FREQUENCIES LESS THAN CUT-OFF FREQUENCY THEREOF

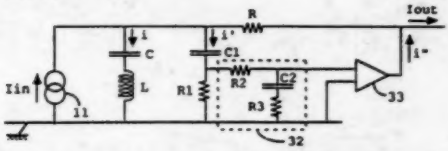
Frédéric Lemaire, Saint Egreve, France, assignor to SGS-Thomson Microelectronics S.A., Gentilly, France

Filed Feb. 14, 1989, Ser. No. 310,113

Claims priority, application France, Feb. 16, 1988, 88 02176

Int. Cl.[5] H03H *5/02*

U.S. Cl. 379—413 **5 Claims**



1. A compensation circuit for the attenuation caused on a line by a series LC type notch filter at frequencies less than the filter cut-off frequency, such filter being connected across the line and a reference voltage node, comprising:

a first resistor (R) in series in the line and having first and second terminals,

a series circuit comprising a capacitor (C1) and a second resistor (R1) connected across the line and the reference voltage node, the capacitor being connected on the side of the first terminal of said first resistor, and

an amplifier (33), the input of which is connected to the connection point of the said capacitor (C1) and of the second resistor (R1) and the output of which is connected to the second terminal of the first resistor (R), such amplifier having a transconductance at said frequencies lower than the filter cut-off frequency of such a value as to feed to the second terminal of said first resistor a current substantially equal to the sum of the currents carried by said series circuit and said notch filter.

4,920,564

MOISTURE BARRIER ASSEMBLY

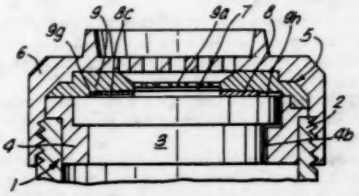
Martin D. Allkins, Ipswich, England, assignor to British Telecommunications public company limited, London, England

Filed Nov. 16, 1988, Ser. No. 271,816

Claims priority, application United Kingdom, Nov. 19, 1987, 8727072

Int. Cl.[5] H04M *1/03;* **H04R** *1/28*

U.S. Cl. 379—437 **12 Claims**



1. A microphone unit for a telephone handset, the microphone unit comprising a microphone mount, a microphone mounted in the microphone mount, and a demountable moisture barrier assembly for preventing ingress of moisture into the microphone, the moisture barrier assembly comprising a support plate, a moisture barrier, and a generally annular seal, the support plate having a perforated portion covered by the moisture barrier, the annular seal being fixed to the peripheral portion of the moisture barrier and to the support plate so as to be sealable against the front face of the microphone, wherein the moisture barrier is fixed to the support plate so as to be spaced by a predetermined distance from the perforated portion, and venting passageway means are provided for venting the space between the moisture barrier and the microphone to a space within said handset on that side of the microphone remote from the moisture barrier.

4,920,565

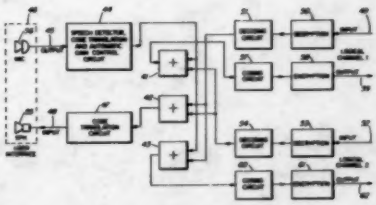
METHOD FOR CONNECTION OF SECURE CONFERENCE CALLS

Leo Strawczynski, Ottawa, and David G. Steer, Nepean, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jul. 18, 1988, Ser. No. 220,190

Int. Cl.[5] H04L *9/04*

U.S. Cl. 380—6 **51 Claims**



41. A secure teleconference network for interconnecting a number of secure telephone sets, comprising:

communications network means having switching nodes and transmission links for establishing a chain-like connection pattern between said secure telephone sets, such that each teleconference user communicates with a user of an adjacent set;

each secure telephone set being comprised of:

means for decrypting a first incoming secure call from a first teleconference user to provide a first incoming signal;

means for decoding said first incoming signal to provide a first incoming speech signal;

means for decrypting a second incoming secure call from a second teleconference user to provide a second incoming signal;

means for decoding said second incoming signal to provide a second incoming speech signal;

user interface means having an input and an output;

means for detecting the presence of and decoding a user's output speech signal from the output of said user interface means;

signal processing circuit means having a first and a second input for receiving said first and second incoming speech signal and a third input for receiving said output speech signal;

first means at said signal processing means for summing said first and second speech signals to provide a first summed signal;

code translation circuit means for conversion of said first summed signal and for forwarding to the input of said user interface means;

second means at said signal processing means for summing said speech signals of said second and third inputs to provide a first outgoing speech signal;

first means for coding said first outgoing speech signal to provide a first outgoing signal;

means for encrypting said first outgoing signal to provide an outgoing secure call for transmission to another teleconference user;

third means at said signal processing means for summing said

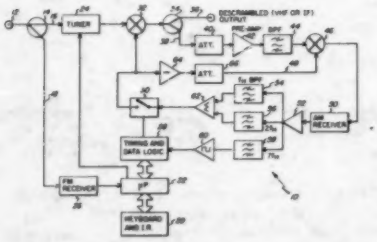
speech signals of said first and third inputs to provide a second outgoing speech signal;
second means for coding said second outgoing speech signal to provide a second outgoing signal for transmission to a second adjacent user;
means for encrypting said second outgoing signal to provide an outgoing secure call for transmission to another teleconference user;
and conference control means for requesting, setting-up and supervising the interconnections of said secure telephone sets through said communications network means.

4,920,566

DUAL LOOP SINEWAVE DESCRAMBLER AND METHOD OF DESCRAMBLING

Clyde Robbins, Maple Glen, and Daniel Marz, Dresher, both of Pa., assignors to General Instrument Corporation, New York, N.Y.

Filed Feb. 1, 1989, Ser. No. 305,434
Int. Cl.[5] H04N *7/167*
U.S. Cl. 380—19 **4 Claims**



1. A method of descrambling a television signal, the video portion of which has been scrambled by a sinewave scrambling signal which is also impressed on the audio portion of the television signal, said method comprising:
receiving a scrambled television signal, said scrambled television signal having a picture carrier and a sound carrier, both of which carriers have AM sinewave modulation for effecting scrambling of the television signal;
applying the received television signal to a dual loop circuit to detect the AM sinewave modulation on the sound carrier;
applying the detected AM sinewave modulation to the picture carrier in a first loop of said circuit to cancel the AM sinewave modulation on the picture carrier; and
applying the detected AM sinewave modulation to the sound carrier in a second loop of said circuit to increase the AM sinewave modulation on the sound carrier.

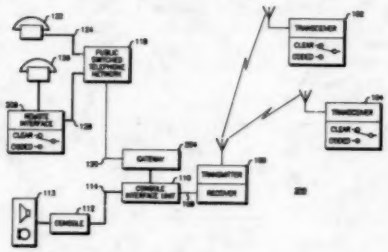
4,920,567

SECURE TELEPHONE TERMINAL

Charles J. Malek, Crystal Lake, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 3, 1986, Ser. No. 682,652
Int. Cl.[5] H04M *11/00*; H04L *9/00*
U.S. Cl. 380—33 **22 Claims**

1. A secure communications system for a plurality of predetermined subscribers, each accessible on a conventional telephone via the telephone network, such that clear analog or encrypted digital message signals may be exchanged end-to-end automatically, the system comprising:
a telephone network having a plurality of predetermined subscribers;
at least two remote interface means, one co-located at each predetermined subscriber's conventional telephone, each including:
(a) signal converting means, including at least a half-duplex modem having a signalling format compatible with other systems, for accommodating clear or encrypted message signals; and
(b) mode selecting means, responsive to said half-duplex modem based upon characteristics of a received inbound message signal applied thereto as well as responsive to a desired mode by the predetermined subscriber, for automatically selecting a clear or encrypted mode in said



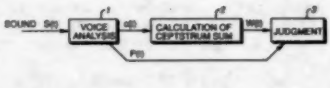
signal converting means, and switching to the encrypted mode upon receipt of a first train which disables echo cancellers on the telephone network and which adjusts adaptive equalizers in the modem to permit passage of high-speed digital data in the encrypted mode, and a second train preceding each transmission of an encrypted message signal, so that secure, end-to-end communications take place automatically over said telephone network.

4,920,568

METHOD OF DISTINGUISHING VOICE FROM NOISE

Shin Kamiya, and Toru Ueda, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 882,233, Jul. 7, 1986, abandoned. This application Oct. 11, 1988, Ser. No. 256,151
Claims priority, application Japan, Jul. 16, 1985, 60-159149; Jun. 4, 1986, 61-130604
Int. Cl.[5] G10L *3/00*
U.S. Cl. 381—46 **5 Claims**



1. A method of distinguishing voice from noise in a sound signal comprising the steps of
sampling a sound signal periodically at a fixed frequency over a sampling period to obtain sampled values,
dividing said sampling period equally into a plural N-number of intervals,
identifying each of said intervals as a vowel interval, a noise interval or a no-sound interval by a predefined identification procedure,
obtaining an N_1-number which is the total number of said intervals identified as a vowel interval, and an N_2-number which is the total number of said intervals identified as a noise interval, and
concluding that said sampling period is a voice period if $(N_1+N_2)/N$ is greater than a predetermined first critical number r_1 and $N_1/(N_1+N_2)$ is greater than a predetermined second critical number r_2,
said predefined procedure for each of said intervals including the steps of

calculating a power value from the absolute squares of said sampled values,

calculating a cepstrum sum from the absolute values of linear predictive (LPC) cepstrum coefficients obtained from said sampled values, and

identifying said interval to be a vowel interval if said power value is greater than an empirically predetermined first threshold value and said cepstrum sum is greater than an empirically predetermined second threshold value.

4,920,569

DIGITAL AUDIO SIGNAL PLAYBACK SYSTEM DELAY

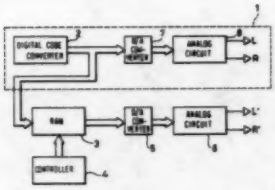
Junichi Yoshio, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. ., 1987, Ser. No. 127,140

Claims priority, application Japan, Dec. 1, 1986, 61-286441

Int. Cl.[5] H03G 3/00; H04H 5/00

U.S. Cl. 381—61 **4 Claims**



1. A signal processing circuit in a playback system for playing back and processing a digital audio signal, said playback system including a digital output stage for producing a digital audio signal, means for converting said digital audio signal to an analog signal and means for providing said analog signal to a first sound reproduction means, said circuit comprising:

storage means for temporarily storing data corresponding to said digital audio signal output from said digital output stage of said playback system:

control means for controlling said storage means in such a manner that said data will be output from said storage means with a time difference with respect to said digital audio signal; and

means for performing computation on said digital audio signal and the data output from said storage means;

wherein an output of said computation performing means is combined with said digital audio signal and the combination thereof is input to said storage means.

4,920,570

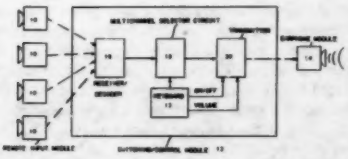
MODULAR ASSISTIVE LISTENING SYSTEM

Henry L. West, 169 Rosemont Dr., Rochester, N.Y. 14617, and Joseph D. Kozelsky, 1214 Gerrads Cross, Webster, N.Y. 14580

Filed Dec. 18, 1987, Ser. No. 134,829

Int. Cl.[5] H04R 25/00; H04B 5/00

U.S. Cl. 381—68 **11 Claims**



1. A modular assistive listening system comprising:

a. a plurality of remote input modules for wireless transmission of a signal;

b. a hand-held switching/control module for receiving the signals transmitted from said plurality of remote input modules and selecting one or more of the signals transmitted from the plurality of remote input modules to form a selected signal, said switching/control module transmitting said selected signal via wireless transmission, wherein said hand-held switching/control module comprises a receiver/decoder circuit, a multichannel selector circuit coupled to said receiver/decoder circuit, a transmitter coupled to said multichannel selector circuit, and an override circuit coupled to said receiver/decoder circuit and said transmitter; and

c. an earphone module for receiving the selected signal transmitted by said switching/control module and reproducing the selected signal as audible sound.

4,920,571

IMAGE PROCESSING SYSTEM WITH CAPABILITY OF ENLARGING AND REDUCING OPERATIONS

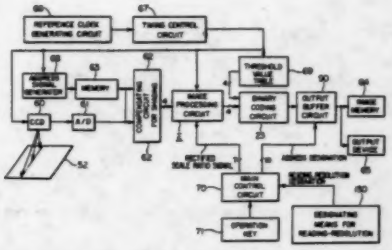
Yoshinori Abe; Masahiko Matsunawa, and Hiroyuki Yamamoto, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 277,460, Nov. 23, 1988, abandoned, which is a continuation of Ser. No. 5,553, Jan. 20, 1987, abandoned. This application May 8, 1989, Ser. No. 349,952

Claims priority, application Japan, Jan. 22, 1986, 61-9946; Mar. 22, 1986, 61-64503; Mar. 22, 1986, 61-64505; Mar. 22, 1986, 61-64506

Int. Cl.[5] G06K 9/42

U.S. Cl. 382—47 **30 Claims**



1. An image processing apparatus for producing an image from image data of pixels and capable of enlarging or reducing the scale of the produced image by interpolating among the image data of pixels to produce an interpolated image, said apparatus comprising:

(a) means for generating image data;

(b) means for producing a scale signal related to a selected scale ratio;

(c) first memory means for storing interpolation data in look-up table form which has a list of plural sets of image data, with each of said plural sets of image data having plural sampling positions corresponding, respectively, to selection signals, each of said sampling positions being provided with interpolation data, whereby said interpolation data is retrievable by addressing said first memory means with any of said plural sets of image data and a selection signal from said selection signals for respectively designating a particular sampling position,

(d) second memory means for storing plural sets of processing data, each such set of processing data comprising said selection signal and a timing signal, wherein said plural sets of processing data correspond to every available scale ratio to form a group of data so that a group of processing data is identifiable by addressing said second memory means with a scale signal related to a selected scale ratio,

(e) outputting means responsive to the means for producing a scale signal for retrieving from the second memory means in response to the scale signal a set of a selection signal and a timing signal corresponding to the selected scale ratio, and

(f) a control means having signal input means for receiving signals from the means for generating image data, the outputting means, and the second memory means, and signal output means coupled to the first memory means, for regulating signal passage to an output device,

said control means feeding said image data and said selection signal into said first memory means so as to address said interpolation data, and

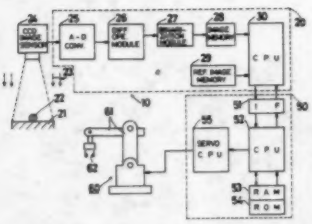
said control means determining the passage of said addressed interpolation data to said output device in accordance with said timing signal.

4,920,572

OBJECT RECOGNITION SYSTEM FOR A ROBOT

Kazuhiko Sugita, Anjyo; Shigeo Hotta, Nagoya; Osamu Matsuda, and Yoichi Yamakawa, both of Kariya, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 1, 1989, Ser. No. 304,563
Claims priority, application Japan, Feb. 1, 1988, 63-21455
Int. Cl.[5] G06K *9/20*
U.S. Cl. 382—48 **4 Claims**



1. An object recognition system for an industrial robot, comprising:

an image sensor for taking up a gray level image of said object to be handled by said robot;

differentiation means responsive to said gray level image of said object for differentiating said gray level image;

binarization means for binarizing the gray levels of picture elements constituting said gray level image, on the basis of a predetermined threshold value so as to extract an accentuated pattern image inherent to the shape of said object;

reference image storage means for storing an accentuated reference pattern image which is inherent to the shape of a model object;

image collation means for collating said accentuated pattern image extracted by said binarization means with said reference accentuated pattern image stored in said reference image storage means; and

position calculation means for calculating the location of said object based on the result of collation obtained by said image collation means;

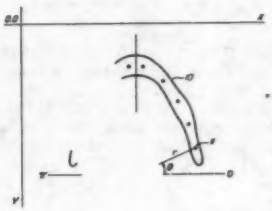
wherein said object takes the form of a substantially cylindrical object, and wherein said image sensor scans said object in a direction transverse to the axis of said cylindrical object so that said binarization means is able to output said accentuated pattern image wherein two parallel strips appear extending in the axial direction of said cylindrical shaft.

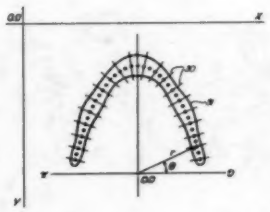
4,920,573

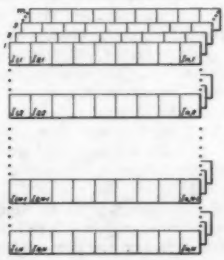
METHOD FOR GENERATING PERPENDICULAR SYNTHESIZED CROSS-SECTIONAL IMAGES

Michael L. Rhodes; Ada Kan, and Eva Tivattanasuk, all of Los Angeles, Calif., assignors to MPDI, Inc., Torrance, Calif.

Filed May 9, 1988, Ser. No. 193,331
Int. Cl.[5] G06K *9/00*
U.S. Cl. 382—6 **5 Claims**







1. A method for selecting and displaying image data corresponding to the intersection of (1) at least one generated line derived initial from an initial curve conforming to a set of initial data points input by a user, with (2) a set of image data produced in a two-dimensional field by a non-intrusive cross-sectional image generating device, comprising the steps of:

a. calculating the coordinates of at least one primary data point on the initial curve;

b. calculating the slope of a perpendicular at the calculated primary data points;

c. at each of the calculated primary data points, calvulating the coordinates of secondary data points a preset distance along a line having the calculated slope of the perpendicular, the secondary data points defining the at least one generated line derived from the initial curve;

d. addressing the set of image data by the coordinates of selected ones of the secondary data points;

e. selecting the image data at each such address; and

f. displaying the selected image data on a display means as an apparent cross-sectional image.

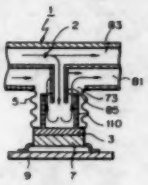
4,920,574

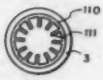
COOLING SYSTEM FOR AN ELECTRONIC CIRCUIT DEVICE

Haruhiko Yamamoto, Yokohama; Masahiro Suzuki, Inagi; Yoshiaki Udagawa, Tokyo; Mitsuhiko Nakata, Kawasaki; Koji Katsuyama, Yokohama; Izumi Ono, Hachioji, and Shunichi Kikuchi, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Division of Ser. No. 914,942, Oct. 3, 1986, Pat. No. 4,879,632.
This application Jul. 30, 1987, Ser. No. 79,876
Claims priority, application Japan, Oct. 4, 1985, 60-221209; Oct. 4, 1985, 60-152137; Nov. 19, 1985, 60-259284; Dec. 3, 1985, 60-273069; Dec. 3, 1985, 60-273070; Dec. 3, 1985, 60-273071; Dec. 3, 1985, 60-273072; Dec. 3, 1985, 60-273073; Dec. 3, 1985, 60-273068; Jan. 28, 1986, 61-17031
Int. Cl.[5] H05K 7/20
U.S. Cl. 361—385 11 Claims

1. In an electronic circuit device comprising a printed circuit board supporting thereon at least one electronic circuit component, a cooling system for the component comprising a cooling module which includes nozzle means for ejecting a coolant therefrom, a first heat transfer plate having a surface directly exposed to the flow of ejected coolant for transferring heat dissipated from the circuit component to the coolant, means on said surface for producing turbulence in the flow of coolant ejected from the nozzle means, and elastic means connected between the cooling module and the first heat transfer plate for resiliently biasing the first heat transfer plate toward the circuit component, said means for producing turbulence comprising a plurality of annular projections which are coaxial to each other and to the center of the flow of the ejected coolant, said projections being arranged on said surface of the first heat transfer plate.





307,350
SHOE UPPER
Paul D. Brown, Hingham, and Judith Ringel, Milton, both of Mass., assignors to Reebok International Ltd., Stoughton, Mass.
Filed Feb. 8, 1989, Ser. No. 307,567
Term of patent 14 years
U.S. Cl. D2—314

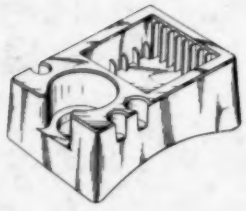
307,351
SHOE SOLE
Toshikazu Kayano, Kobe, Japan, assignor to Asics Corporation, Kobe, Japan
Filed Feb. 4, 1988, Ser. No. 152,226
Claims priority, application Japan, Aug. 8, 1987, 62-32340
Term of patent 14 years
U.S. Cl. D2—320

307,352
PROTECTIVE COVER FOR A TIE
Andre Donnie, and Linda M. Oliver, both of 19004 Haigler Dr., Carson, Calif. 90746
Filed Jul. 30, 1987, Ser. No. 80,461
Term of patent 14 years
U.S. Cl. D2—609

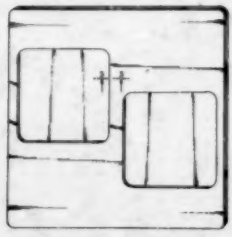
307,353
CRUTCH PAD OR THE LIKE
Yvonne L. Greatwood, 1515 Great Falls St., Apt. 403, McLean, Va. 22101
Filed Apr. 10, 1987, Ser. No. 36,698
Term of patent 14 years
U.S. Cl. D3—10

307,354
CASE
David G. Knotter, 3522 E. Pasadena Ave., Phoenix, Ariz. 85018, and Jody L. Numbers, 7908 E. Oak, Scottsdale, Ariz. 85257
Filed Sep. 29, 1986, Ser. No. 912,817
Term of patent 14 years
U.S. Cl. D3—30.1

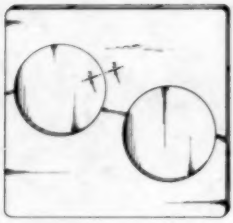
307,355
CAR CADDY
Cornelius D. Page, Jr., Lincolnton, N.C., assignor to Allied Plastics, Inc., Gastonia, N.C.
Filed Oct. 13, 1987, Ser. No. 108,358
Term of patent 14 years
U.S. Cl. D3—40



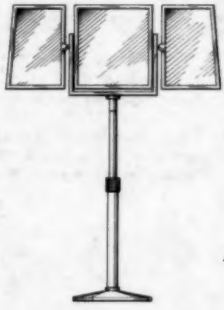
307,356
FRAMING MAT FOR A PHOTO OR THE LIKE
Mark H. Roberts, 34 Cherry Wood La., Flower Hill, N.Y. 11050
Filed Feb. 26, 1986, Ser. No. 836,586
The portion of the term of this patent subsequent to Mar. 27, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—301



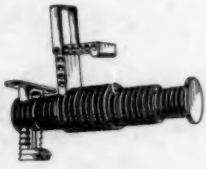
307,357
FRAMING MAT FOR A PHOTO OR THE LIKE
Mark H. Roberts, Flower Hill, N.Y., assignor to Art Leather Manufacturing Co., Elmhurst, N.Y.
Filed Feb. 26, 1986, Ser. No. 836,587
The portion of the term of this patent subsequent to Mar. 27, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—301



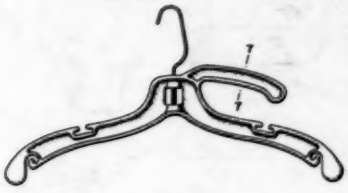
307,358
FREE STANDING PORTABLE ADJUSTABLE MIRROR
Carmel L. Gertson, 14811 Nicholas, Houston, Tex. 77085
Filed Mar. 2, 1988, Ser. No. 162,855
Term of patent 14 years
U.S. Cl. D6—302



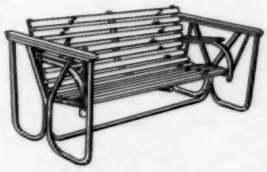
307,359
CLOTHING HANGER BRACKET FOR AUTOMOBILES
Michael T. White, 833 W. 57th Ter., Kansas City, Mo. 64123
Filed Nov. 2, 1987, Ser. No. 115,095
Term of patent 14 years
U.S. Cl. D6—323



307,360
COMBINED CLOTHES HANGER AND HANDLE
Joseph D. McAllister, 3339 Ellengale Drive, Mississauga, Ontario L5C 125, Canada
Filed Jan. 19, 1988, Ser. No. 145,195
Term of patent 14 years
U.S. Cl. D6—318

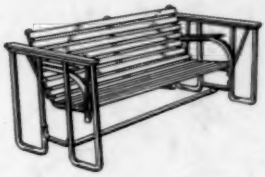


307,361
GLIDER
Charles Pomeroy, and John T. Bycraft, both of South Bend, Ind., assignors to Jack-Post Corporation, Buchanan, Mich.
Filed Jul. 26, 1985, Ser. No. 759,224
The portion of the term of this patent subsequent to Apr. 24, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—347

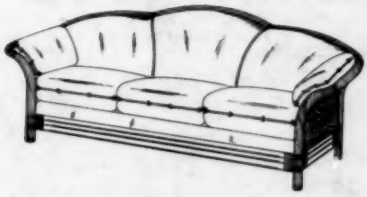


307,362
GLIDER
Charles Pomeroy, and John T. Bycraft, both of South Bend, Ind., assignors to Jack-Post Corporation, Buchanan, Mich.
Filed Jul. 26, 1985, Ser. No. 759,226
The portion of the term of this patent subsequent to Apr. 24, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—347

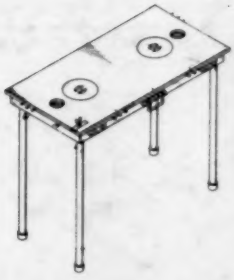
307,363
GLIDER
Charles Pomeroy, and John T. Bycraft, both of South Bend, Ind., assignors to Jack-Post Corporation, Buchanan, Mich.
Filed Jul. 26, 1985, Ser. No. 759,231
The portion of the term of this patent subsequent to Apr. 24, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—347



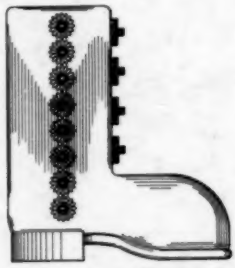
307,364
SOFA
Darrell G. Lowman, Hickory, N.C., assignor to The Lane Company, Alta Vista, Va.
Filed Jan. 13, 1987, Ser. No. 3,375
Term of patent 14 years
U.S. Cl. D6—381



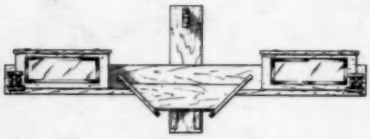
307,365
FISH CLEANING TABLE
James R. Dry, 1348 Rue Crozat, Baton Rouge, La. 70810, and Mark T. Burns, 40166 Autum Hill Dr., Prairieville, La. 70769
Filed Dec. 22, 1986, Ser. No. 944,616
Term of patent 14 years
U.S. Cl. D6—429



307,366
COMBINED SOAP AND TOOTH BRUSH HOLDER
Kenneth R. Merritt, 410 Pilot St., Apt. A-1, Durham, N.C. 27707
Filed Oct. 19, 1987, Ser. No. 110,510
Term of patent 14 years
U.S. Cl. D6—529

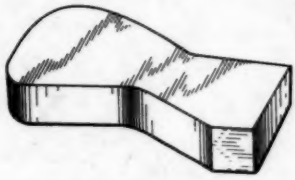


307,367
STORAGE AND DISPLAY UNIT FOR GAME BOARD AND PIECES
Paul Provins, 5211 Marion Ave., Cypress, Calif. 90630
Filed Nov. 5, 1987, Ser. No. 117,143
Term of patent 14 years
U.S. Cl. D6—552

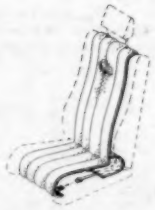


307,368
POSTURE PILLOW
Philip B. Lockhart, and Gene A. Noonan, both of Dubuque, Iowa, assignors to Noolock, Inc., Dubuque, Iowa
Filed Sep. 18, 1987, Ser. No. 98,514
Term of patent 14 years
U.S. Cl. D6—601

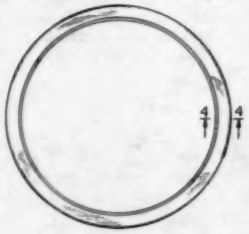
307,369
BODY PILLOW
Chester L. Zollinger, 175 E. 200 North, Providence, Utah 84332
Filed Nov. 17, 1987, Ser. No. 121,733
Term of patent 14 years
U.S. Cl. D6—601



307,370
PARTIAL SEAT COVER FOR USE IN VEHICLES
Bob Bailey, Ballston Lake, and Jeffrey L. Stucker, Salem, both of N.Y., assignors to Racemark International, Inc., Ballston Spa, N.Y., a part interest
Filed Aug. 23, 1988, Ser. No. 236,111
Term of patent 14 years
U.S. Cl. D6—611

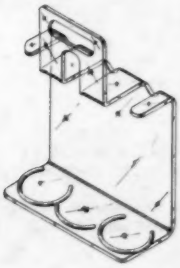


307,371
DOUGH FORMING AND CUTTING DEVICE
Michael D'Orlando, 8701 Shore Rd., Brooklyn, N.Y. 11209
Filed Nov. 6, 1987, Ser. No. 117,576
Term of patent 14 years
U.S. Cl. D7—677



307,372
CAN HOLDER
Richard W. Aylsworth, 74 Victoria Street, Clinton, Ontario N0M 1L0, Canada
Filed Oct. 6, 1987, Ser. No. 105,162
Claims priority, application Canada, Apr. 21, 1987, 21-04-87-5
Term of patent 14 years
U.S. Cl. D7—622

307,373
WINE BOTTLE HOLDER
Harold Bearak, 8221 Del Camino Dr., Scottsdale, Ariz. 85258
Filed Jul. 13, 1987, Ser. No. 72,605
Term of patent 14 years
U.S. Cl. D7—616

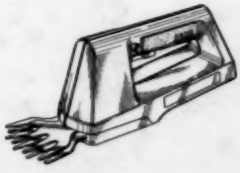


307,374
SHELLFISH OPENING TOOL
Kip C. Lubcke, 277 Gemini Dr., 2C, Somerville, N.J. 08876
Filed Jan. 13, 1988, Ser. No. 143,600
Term of patent 14 years
U.S. Cl. D7—695

307,375
SHELLFISH OPENING TOOL
Kip C. Lubcke, 277 Gemini Dr., 2C, Somerville, N.J. 08876
Filed Jan. 13, 1988, Ser. No. 143,601
Term of patent 14 years
U.S. Cl. D7—695

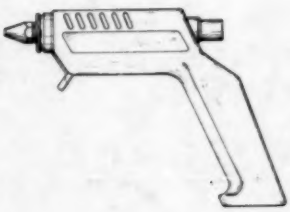
307,376
KNIFE
Kazuo Kawasaki, Fukui, Japan, assignor to Ex-Design Corporation, Fukui, Japan
Filed Sep. 23, 1987, Ser. No. 99,989
Term of patent 14 years
U.S. Cl. D7—652

307,377
GRASS SHEAR
Masakazu Sakamoto, and Kiyoshi Hoshino, both of Tokyo, Japan, assignors to Ryobi Ltd., Hiroshima, Japan
Filed Apr. 19, 1988, Ser. No. 185,769
Claims priority, application Japan, Oct. 23, 1987, 62-43468
Term of patent 14 years
U.S. Cl. D8—8

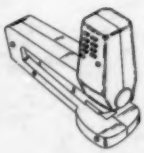


307,378
SNOW PLOW
Sandy R. D'Alessandro, 540 Powers Way, Girard, Ohio 44420
Filed Nov. 13, 1987, Ser. No. 124,119
Term of patent 14 years
U.S. Cl. D8—10

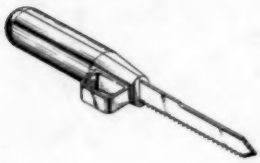
307,379
GLUE GUN
Barry Knispel, Hillsdale, N.J., assignor to Electro-Matic Staplers, Inc., Saddle Brook, N.J.
Filed Jul. 1, 1986, Ser. No. 881,012
Term of patent 14 years
U.S. Cl. D8—14.1



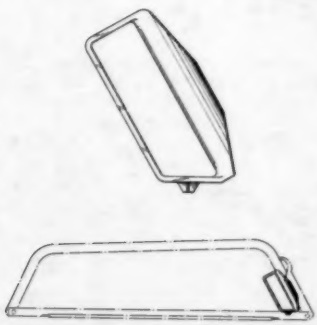
307,380
STAPLER
Carlos L. Jimena, 501 S. Marengo, Pasadena, Calif. 91101
Filed Dec. 30, 1988, Ser. No. 291,992
Term of patent 14 years
U.S. Cl. D8—61



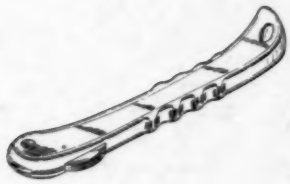
307,381
DRY WALL CUTTER
Hugh J. Kirkpatrick, 505 May Dr., Madison, Tenn. 37115; Thomas J. Lee, and James M. Lee, both of 403 Goldie Ct., Goodlettsville, Tenn. 37072
Filed May 9, 1988, Ser. No. 191,481
Term of patent 14 years
U.S. Cl. D8—95



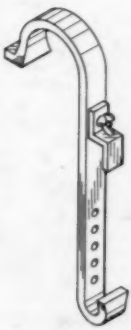
307,382
HANDLE FOR BOW SAW
Tord Englund, Edsbyn, Sweden, assignor to Sandvik AB, Sandviken, Sweden
Filed Dec. 19, 1986, Ser. No. 943,585
Term of patent 14 years
U.S. Cl. D8—97



307,383
SAW HANDLE
Jung-Hua Huang, Lane 7, Sec. 1, Lu Ho Rd., Lukang 50511, Chang Hua, Taiwan
Filed May 19, 1987, Ser. No. 51,605
Term of patent 14 years
U.S. Cl. D8—97

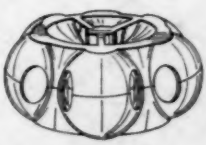


307,384
LADDER HOOK
Charles M. Phillips, 133-10 Cherry Ave., Tyrone, Pa. 16686
Filed Feb. 8, 1988, Ser. No. 153,804
Term of patent 14 years
U.S. Cl. D8—373

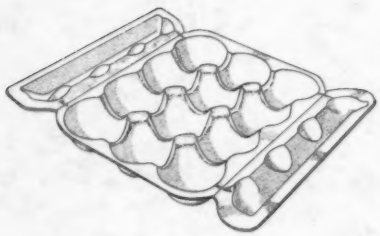


307,385
COLLAPSIBLE BEVERAGE CONTAINER
Kiniehi Kimura, No. 3-21-11, Akazuka Shinmachi, Itabashi-Ku, Tokyo, Japan
Filed Jun. 11, 1987, Ser. No. 60,431
Term of patent 14 years
U.S. Cl. D9—302

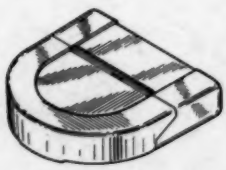
307,386
EGG CARTON
Willy Nussbaumer, 15 rue de Metz, 68260 Kingersheim, France
Filed Jun. 22, 1987, Ser. No. 64,350
Term of patent 14 years
U.S. Cl. D9—341



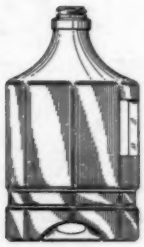
307,387
PRODUCE CONTAINER
Joe R. Payne, La Habra, and Kenneth A. Magoffin, Lake Elsinore, both of Calif., assignors to Dolco Packaging Corporation
Filed Jul. 27, 1987, Ser. No. 78,494
Term of patent 14 years
U.S. Cl. D9—341



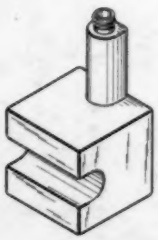
307,388
CONTAINER
Robert E. Newell, Pinner, and Paul K. Rand, Hitchin, both of England, assignors to Glaxo Group Limited, London, England
Filed Feb. 19, 1987, Ser. No. 16,322
Claims priority, application United Kingdom, Aug. 29, 1986, 1036397
Term of patent 14 years
U.S. Cl. D9—345



307,389
BOTTLE
Raymond L. Larson, Fargo, N. Dak., assignor to BMR Investments, Inc., Fargo, N. Dak.
Continuation-in-part of Ser. No. 906,156, Sep. 11, 1986. This application Dec. 11, 1986, Ser. No. 940,842
Term of patent 14 years
U.S. Cl. D9—370



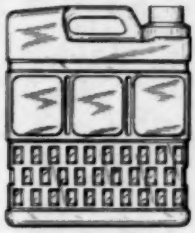
307,390
BOTTLE
Juris M. Mednis, Howell, N.J., assignor to Universal Symetrics Corporation, Howell, N.J.
Filed Nov. 6, 1986, Ser. No. 927,697
Term of patent 14 years
U.S. Cl. D9—375



307,391
BOTTLE BODY
Graham J. Blair, Wirral, England, assignor to Lever Brothers Company, New York, N.Y.
Filed Apr. 15, 1987, Ser. No. 38,800
Claims priority, application United Kingdom, Oct. 16, 1986, 1037425
Term of patent 14 years
U.S. Cl. D9—376

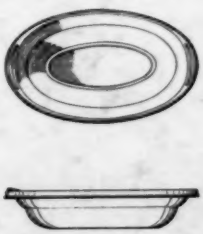
307,392
BOTTLE
Richard L. Weckman, Perrysburg, Ohio, assignor to Owens-Illinois Plastic Products Inc., Toledo, Ohio
Filed Aug. 24, 1987, Ser. No. 88,790
Term of patent 14 years
U.S. Cl. D9—376

307,393
FLUID CONTAINER
George R. Conrad, Dunwoody, Ga., assignor to General Electric Company, Mt. Vernon, Ind.
Filed Jun. 8, 1988, Ser. No. 203,799
Term of patent 14 years
U.S. Cl. D9—376

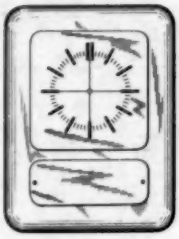


307,394
BOTTLE
Richard B. Wetherell, Jr., Gales Ferry, Conn., assignor to Inopak Plastics Corporation, Chesterfield, Mo.
Filed Dec. 29, 1986, Ser. No. 947,470
Term of patent 14 years
U.S. Cl. D9—378

307,395
FOOD RECEPTACLE
Rodney D. Borst, Oregon, Wis., assignor to Hoechst Celanese Corporation
Filed Dec. 2, 1986, Ser. No. 937,121
Term of patent 14 years
U.S. Cl. D9—428



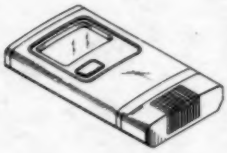
307,396
COMBINED CLOCK AND WALL PLAQUE
Peter V. Ilaria, East Hanover, and William Macowski, Caldwell, both of N.J., assignors to Tropar Manufacturing Co., Inc., Florham Park, N.J.
Filed Dec. 3, 1986, Ser. No. 937,671
Term of patent 14 years
U.S. Cl. D10—24



307,397
PAPER TESTING MACHINE
Olavi Lehtikoski, Varkaus, Finland, assignor to Robotest Oy, Kangaslampi, Finland
Filed Mar. 9, 1987, Ser. No. 23,468
Term of patent 14 years
U.S. Cl. D10—46

307,398
ATOMIC ABSORPTION SPECTROPHOTOMETER
Shouji Umemoto, Kodaira; Masamichi Tsukada, Ibaragi, and Masatoshi Kitagawa, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jul. 7, 1987, Ser. No. 70,536
Claims priority, application Japan, Jan. 7, 1987, 62-37
Term of patent 14 years
U.S. Cl. D10—46

307,399
REFLECTANCE METER
Kenneth D. Collister, Elkhart, Ind., assignor to Miles Inc., Elkhart, Ind.
Filed Oct. 28, 1987, Ser. No. 113,728
Term of patent 14 years
U.S. Cl. D10—46

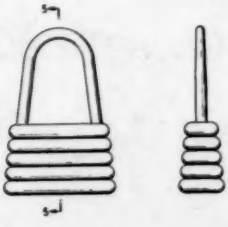


307,400
ELECTRONIC ARTICLE SURVEILLANCE ANTENNA STRUCTURE
Eric J. Armstrong, Pennsburg; James B. Eldon, Barto, and Lee T. Lamond, North Wales, all of Pa., assignors to Checkpoint Systems, Inc., Thorofare, N.J.
Filed Jan. 25, 1988, Ser. No. 147,672
Term of patent 14 years
U.S. Cl. D10—106

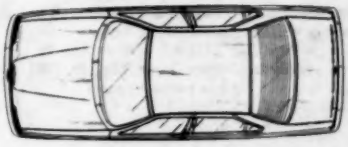
307,401
BADGE
Gregory D. Sunstrum, 2307 Westmount Road NW., Calgary, Alberta, Canada (T2N 3N7)
Filed Mar. 11, 1987, Ser. No. 24,394
Term of patent 14 years
U.S. Cl. D11—108

307,402
COMBINED LAWN ORNAMENT AND SPRINKLER
Raymond R. Rouse, Jr., 518 Washington St., and Donald Basen, 828 Union St., both of Hudson, N.Y. 12534
Filed Aug. 24, 1987, Ser. No. 88,900
Term of patent 14 years
U.S. Cl. D11—157

307,403
PULL TAB OF SLIDER FOR SLIDE FASTENER
Sadaho Asahi, Uozu, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan
Filed Feb. 18, 1987, Ser. No. 15,968
Claims priority, application Japan, Mar. 11, 1986, 61-8675
Term of patent 14 years
U.S. Cl. D11—221



307,404
AUTOMOTIVE VEHICLE
Giorgio Gueifi, Milan; Ezio Villa; Franco Mendicino, both of Arese; Renato Pasquali, Garbagnate, and Alberto Alberti, Legnano, all of Italy, assignors to Alfa Lancia Industriale S.r.l., Arese, Italy
Filed Feb. 25, 1987, Ser. No. 18,980
Term of patent 14 years
U.S. Cl. D12—92



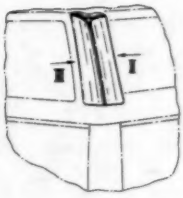
307,405
BICYCLE STEM
Hiroyuki Kiyota, Tokyo, Japan, assignor to Sakae Ringyo Co., Ltd., Tokyo, Japan
Filed Apr. 3, 1987, Ser. No. 33,633
Term of patent 14 years
U.S. Cl. D12—118

307,406
AUTOMOBILE TIRE
Kouichi Tatsumi, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Japan
Filed Mar. 17, 1987, Ser. No. 26,563
Claims priority, application Japan, Dec. 9, 1986, 61-48714
Term of patent 14 years
U.S. Cl. D12—147

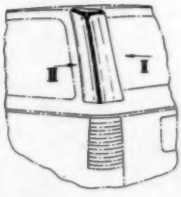
307,407
VEHICLE TIRE
Masaaki Minamitani, Osaka, Japan, assignor to The Ohtsu Tire & Rubber Co., Ltd., Izumi-Ohtsu, Japan
Filed Aug. 11, 1987, Ser. No. 84,000
Claims priority, application Japan, Mar. 13, 1987, 62-9678
Term of patent 14 years
U.S. Cl. D12—147

307,408
VEHICLE WINDSHIELD WIPER UNIT
Peter Mower, Whitton, and Peter C. Pethers, Winkfield, both of England, assignors to Trico Products Corporation, Buffalo, N.Y.
Filed Mar. 20, 1986, Ser. No. 845,410
Claims priority, application United Kingdom, Sep. 24, 1985, 1029455
Term of patent 14 years
U.S. Cl. D12—155

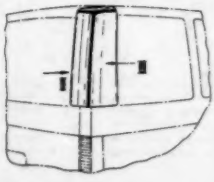
307,409
WIND DEFLECTOR
John A. Bott, 931 Lakeshore Dr., Groose Pointe Shores, Mich. 48236
Filed Mar. 4, 1987, Ser. No. 21,439
The portion of the term of this patent subsequent to Apr. 24, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—181



307,410
WIND DEFLECTOR
John A. Bott, 931 Lakeshore Dr., Grosse Pointe Shores, Mich. 48236
Filed Mar. 4, 1987, Ser. No. 21,440
The portion of the term of this patent subsequent to Apr. 24, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—181



307,411
WIND DEFLECTOR
John A. Bott, 931 Lakeshore Dr., Grosse Pointe Shores, Mich. 48236
Filed Mar. 19, 1987, Ser. No. 27,815
The portion of the term of this patent subsequent to Apr. 24, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—181



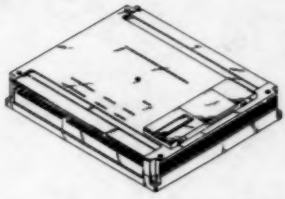
307,412
VEHICLE HOOD ORNAMENT
Elmar Kaiser, Jr., 6 Route de Meyrin, CH-1202 Geneva, Switzerland
Filed Mar. 20, 1987, Ser. No. 28,325
Claims priority, application World Int. Prop. O., Sep. 29, 1986, DM007540
Term of patent 14 years
U.S. Cl. D12—198

307,413
COMBINED VEHICLE FENDER AND RUNNING BOARD UNIT
David L. Bradley, Edwardsburg, Mich., assignor to Quality Components, Inc., Elkhart, Ind.
Filed Sep. 4, 1987, Ser. No. 93,385
Term of patent 14 years
U.S. Cl. D12—203

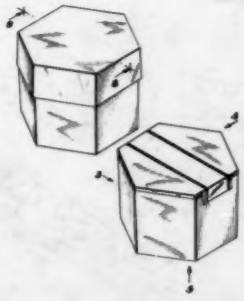
307,414
WATERCRAFT
Denys Lapointe, St-Elie d'Orford, Canada, assignor to Bombardier Inc., Canada
Filed Mar. 14, 1988, Ser. No. 167,417
Term of patent 14 years
U.S. Cl. D12—307

307,415
PROGRAMMING AND CONTROL BOX FOR AN INDUSTRIAL ROBOT
Anders Holmer, Västerås; Owe Pettersson, Surahammar; Mats Tornros, Västerås, and Peter Maddock, Stockholm, all of Sweden, assignors to Asea AB, Västerås, Sweden
Filed Dec. 5, 1986, Ser. No. 938,763
Claims priority, application Sweden, Jun. 5, 1986, 86-1370
Term of patent 14 years
U.S. Cl. D13—164

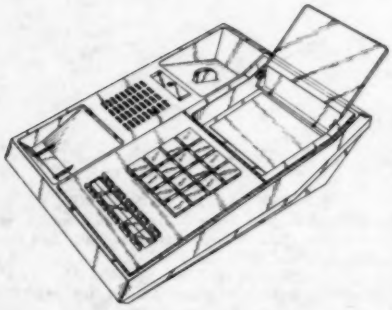
307,416
PROGRAMMABLE CONTROLLER
Yoshinori Abe, Kanagawa; Muneaki Inoue, and Kazuhiro Hata, both of Hyogo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 29, 1987, Ser. No. 139,241
Claims priority, application Japan, Aug. 31, 1987, 62-35759
Term of patent 14 years
U.S. Cl. D13—164



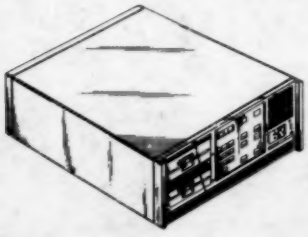
307,417
MAGNET PICK-UP
John S. Doyel, 404 W. 20th St., New York, N.Y. 10011
Filed Nov. 4, 1986, Ser. No. 927,411
Term of patent 14 years
U.S. Cl. D13—183



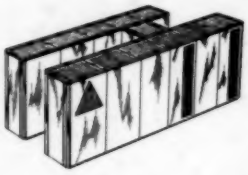
307,418
TELEPHONE BASE
Joseph G. Aschauer, Newtown, and John Cuccio, Westport, both of Conn., assignors to TIE Communications, Inc., Shelton, Conn.
Filed Jun. 15, 1988, Ser. No. 207,305
Term of patent 14 years
U.S. Cl. D14—151



307,419
DISPLAY TERMINAL CONTROLLER
David L. Schaum, Woodstock, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 9, 1986, Ser. No. 940,719
Term of patent 14 years
U.S. Cl. D14—100

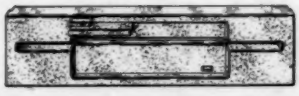


307,420
CENTRAL PROCESSOR UNIT
Koushiro Adachi, Tokorozawa; Shinji Shibuya, Kodaira; Tamotsu Tsukaguchi, Hiratsuka, and Mitsuo Miyamoto, Hatano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jul. 23, 1987, Ser. No. 76,661
Claims priority, application Japan, Jan. 28, 1987, 62-2716
Term of patent 14 years
U.S. Cl. D14—102

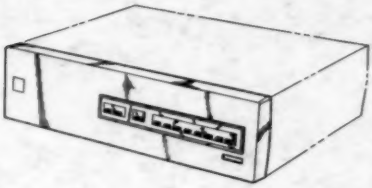


307,421
DIGITIZING PEN
Thomas A. Tedham, Salem, and Kenichi Akagi, Littleton, both of Mass., assignors to Wang Laboratories, Inc., Lowell, Mass.
Filed Oct. 20, 1988, Ser. No. 260,545
Term of patent 14 years
U.S. Cl. D14—114

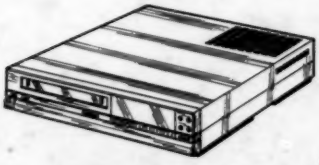
307,422
FRONT PANEL FOR FLOPPY DISK DRIVE
Peter A. Ronzani, Los Gatos, Calif., assignor to Konica Corporation, Tokyo, Japan
Filed Jan. 15, 1987, Ser. No. 3,704
Term of patent 14 years
U.S. Cl. D14—115



307,423
FRONT PANEL FOR A LINK PROTOCOL CONVERTER
David W. Hill, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed May 18, 1987, Ser. No. 51,111
Term of patent 14 years
U.S. Cl. D14—115



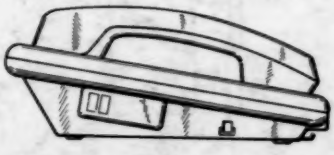
307,424
VIDEO CASSETTE RECORDER
Jae J. Shim, Kwachon, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea
Filed Feb. 27, 1987, Ser. No. 20,315
Claims priority, application Rep. of Korea, Nov. 12, 1986, 15929/86
Term of patent 14 years
U.S. Cl. D14—135



307,425
VIDEO CASSETTE RECORDER
Jae J. Shim, Kwachon, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea
Filed Feb. 27, 1987, Ser. No. 20,319
Claims priority, application Rep. of Korea, Sep. 2, 1986, 12568/86
Term of patent 14 years
U.S. Cl. D14—135

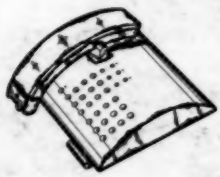
307,426
TELEPHONE SET
Fumiharu Ohta, Atsugi, and Kazumasa Takenaka, Sagamihara, both of Japan, assignors to Matsushita Electric Industrial Co.
Filed Jul. 20, 1988, Ser. No. 221,912
Claims priority, application Japan, Mar. 10, 1988, 63-9744
Term of patent 14 years
U.S. Cl. D14—142

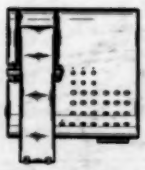
307,427
TELEPHONE SET
Marian H. Polhemus, Chicago, Ill., assignor to NEC Home Electronics U.S.A. Inc., Wood Dale, Ill.
Filed Jun. 3, 1988, Ser. No. 203,023
Term of patent 14 years
U.S. Cl. D14—151



307,428
HANDSET AND STAND TELECOMMUNICATION INSTRUMENT
Herbert Pfeifer, Campbell; Paul Montgomery, San Francisco, and Dan Sturges, Campbell, all of Calif., assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea
Filed Aug. 16, 1988, Ser. No. 232,883
Claims priority, application Rep. of Korea, Apr. 19, 1988, 1988-5289
Term of patent 14 years
U.S. Cl. D14—151

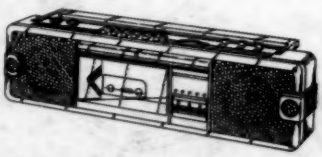
307,429
HANDSET AND STAND TELECOMMUNICATION INSTRUMENT
Herbert Pfeifer, Campbell; Paul Montgomery, San Francisco, and Dan Sturges, Campbell, all of Calif., assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea
Filed Aug. 16, 1988, Ser. No. 233,252
Claims priority, application Rep. of Korea, Apr. 19, 1988, 1988-5290
The portion of the term of this patent subsequent to Apr. 24, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—151





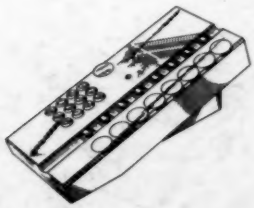
307,430
TELEPHONE BASE UNIT
Guy E. Desbarats, London, England, assignor to British Telecommunications public limited company, London, England
Filed Nov. 30, 1988, Ser. No. 277,920
Claims priority, application United Kingdom, Jun. 1, 1988, 1051084
Term of patent 14 years
U.S. Cl. D14—151

307,431
CASSETTE TAPE RECORDER
Young H. Ham, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea
Filed Oct. 27, 1987, Ser. No. 113,270
Claims priority, application Rep. of Korea, May 6, 1987, 6666/1987
Term of patent 14 years
U.S. Cl. D14—165

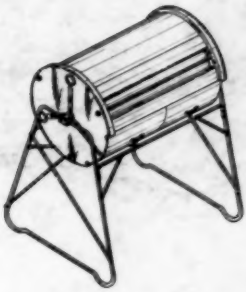


307,432
REMOTE CONTROLLER FOR VIDEO TAPE RECORDER
Seiji Usami; Yoshihiro Yanagihara, and Hiroyuki Mitsui, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Nov. 14, 1988, Ser. No. 271,073
Claims priority, application Japan, Jun. 2, 1988, 63-21769
Term of patent 14 years
U.S. Cl. D14—218

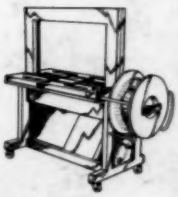
307,433
TELEPHONE COMMUNICATION MODULE OR SIMILAR ARTICLE
Rodney J. White, Hertford, Great Britain, assignor to Speakerbus Limited, Hoddesdon, England
Filed Nov. 18, 1988, Ser. No. 273,009
Claims priority, application United Kingdom, May 19, 1988, 1050851
Term of patent 14 years
U.S. Cl. D14—240



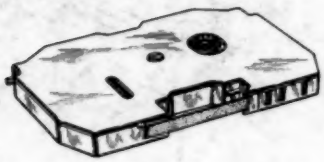
307,434
COMPOST MIXER
Robert A. Payack, Schenectady, and Alfred J. Bold, Waterford, both of N.Y., assignors to Garden Way Incorporated, Troy, N.Y.
Filed Apr. 17, 1987, Ser. No. 39,365
Term of patent 14 years
U.S. Cl. D15—10



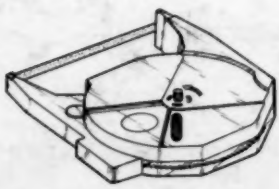
307,435
AUTOMATIC STRAPPING MACHINE
Yasunori Sakaki, Tokyo, and Tsutomu Tagomori, Yokohama, both of Japan, assignors to Strapack Corporation, Tokyo Japan
Filed Nov. 19, 1987, Ser. No. 122,430
Claims priority, application Japan, May 27, 1987, 62-20658
Term of patent 14 years
U.S. Cl. D15—145



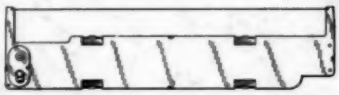
307,436
INK RIBBON CASSETTE FOR ELECTRONIC TYPEWRITER
Aiko Endo, Tokyo, and Koh Hasegawa, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Japan
Filed Dec. 15, 1986, Ser. No. 941,946
Claims priority, application Japan, Jun. 17, 1986, 61-23365
Term of patent 14 years
U.S. Cl. D18—12



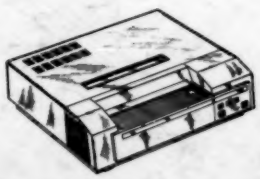
307,437
RIBBON CASSETTE FOR A TYPEWRITER OR THE LIKE
Jorge Costa, Yverdon-les-Bains, Switzerland, assignor to Hermes Precisa International SA, Switzerland
Filed Apr. 28, 1987, Ser. No. 43,687
Claims priority, application Int'l Pat. Institute, Nov. 19, 1986, DM/007806
Term of patent 14 years
U.S. Cl. D18—12



307,438
INK RIBBON CASSETTE FOR AN ELECTRONIC COMPUTER
Hidetoshi Kodama, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Aug. 24, 1987, Ser. No. 88,944
Claims priority, application Japan, Feb. 24, 1987, 62-6770
The portion of the term of this patent subsequent to Apr. 17, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D18—12

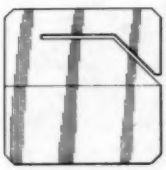


307,439
PRINTER
Susumu Doi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 20, 1987, Ser. No. 16,840
Claims priority, application Japan, Aug. 28, 1986, 61-33766
Term of patent 14 years
U.S. Cl. D18—13

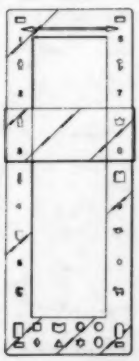


307,440
PRINTER
Seiichi Omino; Aiko Endo, both of Tokyo, and Katsuhiro Watanabe, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 4, 1987, Ser. No. 81,162
Claims priority, application Japan, Feb. 9, 1987, 62-4941
Term of patent 14 years
U.S. Cl. D18—13

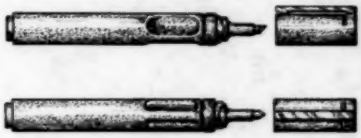
307,441
SELF-ADJUSTING BOOK MARK
Walter H. Roberson, Jr., 1002 Raymond Ave., Altamonte Springs, Fla. 32701
Filed Sep. 8, 1986, Ser. No. 905,031
Term of patent 14 years
U.S. Cl. D19—34



307,442
COMBINED BOOK MARK AND TEMPLATE
William K. Cooper, 9406 Manchester, Kansas City, Mo. 64138
Filed Jan. 20, 1987, Ser. No. 5,406
Term of patent 14 years
U.S. Cl. D19—34



307,443
MARKING INSTRUMENT
Norman D. Poisson, Andover, Mass.; Walter B. Herbst, Evanston, and Kurt Peterson, Park Ridge, both of Ill., assignors to The Gillette Company, Boston, Mass.
Filed Feb. 9, 1987, Ser. No. 12,709
Term of patent 14 years
U.S. Cl. D19—43

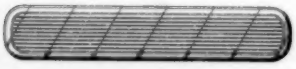


307,444
GRIP PORTION FOR A WRITING INSTRUMENT
Norman D. Poisson, Andover; Scott G. Searle, Sudbury; Robert D. Warren, Wellesley, all of Mass.; Jeffrey Kapec, Westport, and Kazuna Tanaka, Cos Cob, both of Conn., assignors to The Gillette Company, Boston, Mass.
Filed Feb. 9, 1987, Ser. No. 12,708
Term of patent 14 years
U.S. Cl. D19—55

307,445
COMBINED WRITING PAD AND PENCIL HOLDER
Steven E. Greenhut, 2781 Belgrave Rd., Pepper Pike, Ohio 44124, and Sheldon Goodman, 4079 Princeton Blvd., South Euclid, Ohio 44121
Filed Nov. 21, 1986, Ser. No. 933,695
Term of patent 14 years
U.S. Cl. D19—78

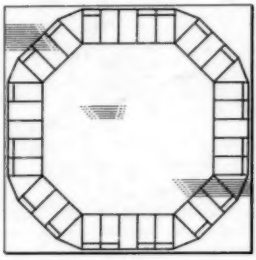
307,446
VENDING MACHINE FOR FOODS
Leonard A. Ficken, St. Louis, Mo., assignor to Unidynamics Corporation, New York, N.Y.
Filed Jul. 14, 1986, Ser. No. 885,483
Term of patent 14 years
U.S. Cl. D20—4

307,447
SIGN
Mel Evenson, San Pedro, Calif., assignor to Eldon Industries, Inc., Inglewood, Calif.
Filed Sep. 8, 1987, Ser. No. 93,873
Term of patent 14 years
U.S. Cl. D20—10

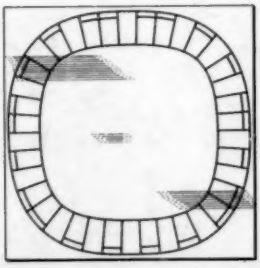


307,448
PEG BOARD SIGN HOLDER
W. Stephen Akard, 405 N. 1000 East, Zionsville, Ind. 46077
Filed Jun. 9, 1987, Ser. No. 59,833
Term of patent 14 years
U.S. Cl. D20—43

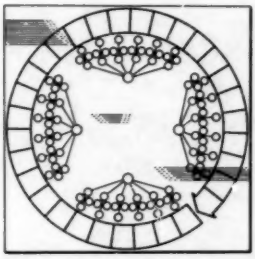
307,449
GAME BOARD OR SIMILAR ARTICLE
Paul B. McKeehan, 8507 Farralone Ave., West Hills, Calif. 91304
Filed Nov. 17, 1986, Ser. No. 931,159
Term of patent 14 years
U.S. Cl. D21—34



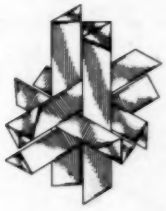
307,450
GAME BOARD OR SIMILAR ARTICLE
Paul B. McKeehan, 8507 Farralone Ave., West Hills, Calif. 91304
Filed Nov. 17, 1986, Ser. No. 931,158
Term of patent 14 years
U.S. Cl. D21—35



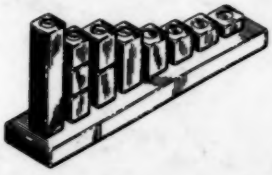
307,451
GAME BOARD OR SIMILAR ARTICLE
Paul B. McKeehan, 8507 Farralone Ave., West Hills, Calif. 91304
Filed Nov. 17, 1986, Ser. No. 931,161
Term of patent 14 years
U.S. Cl. D21—35



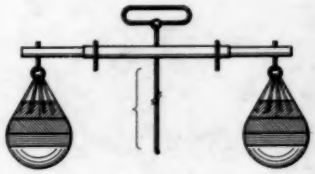
307,452
TOY PUZZLE
Donald J. Laubscher, Buckeye, Ariz., assignor to Delbert W. Hicks, Phoenix, Ariz.
Filed Nov. 2, 1987, Ser. No. 115,181
Term of patent 14 years
U.S. Cl. D21—107



307,453
FRACTIONAL BLOCK SET
Charles A. Russel, Oklahoma City, Okla., assignor to Tangible Concepts, Inc., Oklahoma City, Okla.
Filed Jun. 24, 1986, Ser. No. 877,978
Term of patent 14 years
U.S. Cl. D21—108



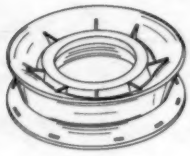
307,454
PORTABLE WEIGHT EXERCISER
James C. Driscoll, 335 E. Harmon, Apt. 153, Las Vegas, Nev. 89109
Filed Jan. 15, 1988, Ser. No. 144,072
Term of patent 14 years
U.S. Cl. D21—196



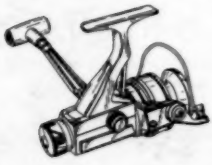
307,455
GOLF CLUB PUTTER HEAD
David D. Boone, El Toro, Calif., assignor to Lynx Golf, Inc., City of Industry, Calif.
Filed Apr. 6, 1987, Ser. No. 34,581
Term of patent 14 years
U.S. Cl. D21—219

307,456
SLINGSHOT FRAME
Raynold A. Eld, 302 E. 39 St., Boise, Id. 83714, assignor to Raynold A. Eld, Boise, Id.
Filed Sep. 26, 1986, Ser. No. 852,502
Term of patent 14 years
U.S. Cl. D22—106

307,457
FISHING HAND CASTER
Alexander S. Corrie, 36 Manilla Street, East Brisbane, Australia (4169)
Filed Mar. 2, 1987, Ser. No. 20,677
Claims priority, application Australia, Dec. 15, 1986, 7919/86
Term of patent 14 years
U.S. Cl. D22—137

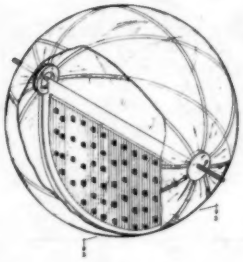


307,458
REEL FOR FISHING
Kanji Iinuma, Musashino, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan
Filed Aug. 31, 1987, Ser. No. 90,921
Claims priority, application Japan, Mar. 4, 1987, 8206/87
Term of patent 14 years
U.S. Cl. D22—141



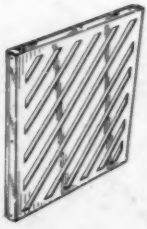
307,459
REEL FOR FISHING
Yasuhisa Kameda, Musashino, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan
Filed Aug. 31, 1987, Ser. No. 90,922
Claims priority, application Japan, Mar. 4, 1987, 8205/87
Term of patent 14 years
U.S. Cl. D22—141

307,460
INFLATABLE, REFLECTIVE SOLAR EVAPORATOR
Rodney Bradford, 1210 Kennamer Dr., SE., Huntsville, Ala. 35801, and Lott W. Brantley, 117 Ninth Ave., Arab, Ala. 35016
Filed Jun. 22, 1987, Ser. No. 64,921
Term of patent 14 years
U.S. Cl. D23—207

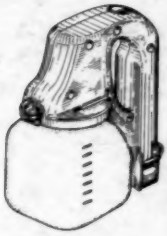


307,461
ENGINE OIL FILTER FOR A MOTOR VEHICLE
Byoung D. Kim, 649-5, Hannam-Dong, Yongsan-Ku, Seoul, Rep. of Korea
Filed Apr. 7, 1987, Ser. No. 35,289
Term of patent 14 years
U.S. Cl. D23—209

307,462
GREASE FILTER FOR USE IN RESTAURANTS OR THE LIKE
Christ S. Merkouris, 8546 S. McVicker, Burbank, Ill. 60459
Filed May 21, 1987, Ser. No. 52,741
Term of patent 14 years
U.S. Cl. D23—209

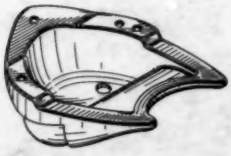


307,463
ELECTRIC SPRAYER
Fusao Fushiya, and Katsumi Tozawa, both of Anjo, Japan, assignors to Makita Electric Works, Ltd., Anjo, Japan
Filed Aug. 11, 1987, Ser. No. 84,671
Claims priority, application Japan, Feb. 13, 1987, 62-5352
Term of patent 14 years
U.S. Cl. D23—225

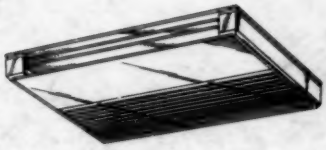


307,464
FAUCET HANDLE
Gerhard E. Joerger, Hans-Thoma-Strasse 93, G-6800 Mannheim 25, Fed. Rep. of Germany
Filed Mar. 31, 1987, Ser. No. 32,823
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1986, MR V/1333
Term of patent 14 years
U.S. Cl. D23—251

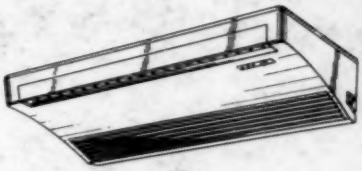
307,465
SHAMPOO BASIN
Michael Phillips, P.O. Box 35395, Houston, Tex. 77235-5395
Continuation of Ser. No. 826,723, Feb. 6, 1986. This application Mar. 6, 1989, Ser. No. 318,380
Term of patent 14 years
U.S. Cl. D23—289



307,466
AIR CONDITIONER
Masahito Takasuna, Chiba, and Takuma Watanabe, Kanagawa, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan
Filed Jun. 19, 1988, Ser. No. 145,197
Claims priority, application Japan, Oct. 21, 1987, 62-42756
Term of patent 14 years
U.S. Cl. D23—351



307,467
AIR CONDITIONER
Kenji Shimano; Shusuke Yamazaki, both of Tokyo, and Yoshinori Katagami, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan
Filed Mar. 24, 1988, Ser. No. 172,340
Claims priority, application Japan, Sep. 24, 1987, 62-38493
Term of patent 14 years
U.S. Cl. D23—351

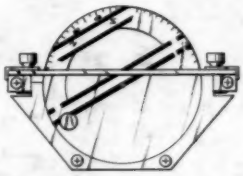


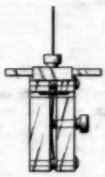
307,468
AIR FRESHENER DISPENSER
Alfred E. Booth, Jr., Torrance, Calif., assignor to Products by DesignAir, Inc., Marina del Ray, Calif.
Filed Apr. 15, 1988, Ser. No. 182,310
Term of patent 14 years
U.S. Cl. D23—366

307,469
AIR FRESHENER
Ronald R. Gutkowski, Racine County, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Mar. 31, 1987, Ser. No. 32,650
Term of patent 14 years
U.S. Cl. D23—367

307,470
ELECTRIC FAN
Toshiyuki Utsuki, Tachikawa; Shuichi Kouno, Tokorozawa, and Kenichi Watanabe, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Mar. 4, 1987, Ser. No. 21,432
Claims priority, application Japan, Nov. 25, 1986, 61-46216
Term of patent 14 years
U.S. Cl. D23—378

307,471
DENTAL INSTRUMENT HONE
Steven B. Moore, 7846 S. Logan St., Littleton, Colo. 80122
Filed Aug. 31, 1987, Ser. No. 91,428
Term of patent 14 years
U.S. Cl. D24—16

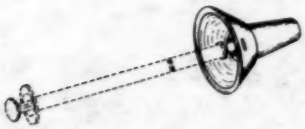




307,472
DRILL-MOUNTABLE TOOL FOR THE INSTALLATION AND REMOVAL OF THREADED DENTAL PROSTHETIC ELEMENTS
Per O. Söderberg, Stockholm, Sweden, assignor to Astra Meditec Aktiebolog, Mölndal, Sweden
Filed Oct. 21, 1987, Ser. No. 112,141
Claims priority, application Sweden, Apr. 22, 1987, 870922
Term of patent 14 years
U.S. Cl. D24—16

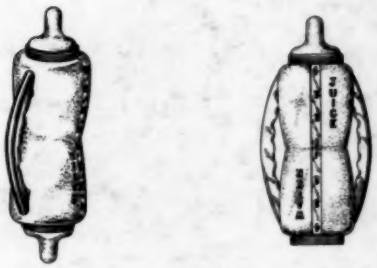
307,473
DENTAL PLIERS SHIELD
Donald L. Hannula, San Diego, Calif., assignor to Johnson & Johnson Consumer Products, Inc., New Brunswick, N.J.
Filed Jan. 12, 1988, Ser. No. 143,105
Term of patent 14 years
U.S. Cl. D24—16

307,474
SYRINGE SHIELD
June C. Cook, Rte. 1, Box 260, Altus, Ark. 72821
Filed Nov. 9, 1987, Ser. No. 118,357
Term of patent 14 years
U.S. Cl. D24—25



307,475
SCALP MASSAGER
Fred A. Bomkamp, 1715 W. Lawrence, Phoenix, Ariz. 85021
Filed Mar. 17, 1987, Ser. No. 26,652
Term of patent 14 years
U.S. Cl. D24—36

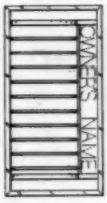
307,476
BABY BOTTLE
Vivian Gonzalez, 920 E. 11 Pl., Hialeah, Fla. 33010, and Rebeca Trujillo, 8010 NW. 167 Ter., Miami Lakes, Fla. 33016
Filed Aug. 4, 1987, Ser. No. 81,177
The portion of the term of this patent subsequent to Apr. 24, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D24—47



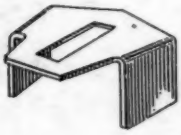
307,477
BABY BOTTLE
Vivian Gonzalez, 920 E. 11 Pl., Hialeah, Fla. 33010, and Rebeca Trujillo, 8010 NW. 167 Ter., Miami Lakes, Fla. 33016
Filed Aug. 4, 1987, Ser. No. 81,178
The portion of the term of this patent subsequent to Apr. 24, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D24—47

307,478
BREAST PUMP
Yasuo Morifuji, Osaka, Japan, assignor to Jex Co., Ltd., Osaka, Japan
Filed Aug. 3, 1988, Ser. No. 227,747
Term of patent 14 years
U.S. Cl. D24—51

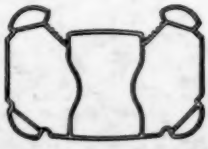
307,479
SECURITY DOOR
Richard Bennett; Steven B. Evans, both of Detroit, and Damon A. Davis, Ann Arbor, all of Mich., assignors to Daris Design Company, Detroit, Mich.
Filed Aug. 20, 1987, Ser. No. 87,622
Term of patent 14 years
U.S. Cl. D25—48



307,480
SPACER ELEMENT FOR SCAFFOLDING
John G. Brasil, Mississauga, Canada, assignor to Anthes Industries, Inc., Ontario, Canada
Filed Oct. 19, 1988, Ser. No. 260,352
Term of patent 14 years
U.S. Cl. D25—68

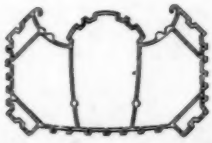


307,481
DECORATIVE EXTRUSION
Peter M. Stagl, Morris Plains, N.J., assignor to Avnet, Inc., Great Neck, N.Y.
Filed Mar. 21, 1988, Ser. No. 170,467
Term of patent 14 years
U.S. Cl. D25—122

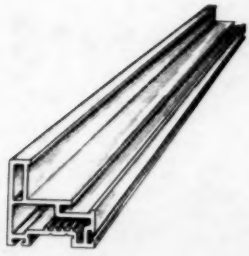


307,482
DECORATIVE EXTRUSION
Peter M. Stagl, Morris Plains, N.J., assignor to Avnet, Inc., Great Neck, N.Y.
Filed Mar. 21, 1988, Ser. No. 170,468
Term of patent 14 years
U.S. Cl. D25—122

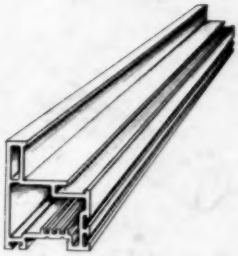
307,483
DECORATIVE EXTRUSION
Peter M. Stagl, Morris Plains, N.J., assignor to Avnet, Inc., Great Neck, N.Y.
Filed Mar. 21, 1988, Ser. No. 170,470
Term of patent 14 years
U.S. Cl. D25—122



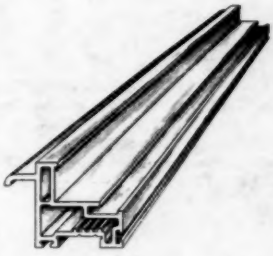
307,484
DESIGN FOR A WINDOW COMPONENT EXTRUSION
Dennis Westphal, Galva, and Jonathan Piles, McPherson, both of Kans., assignors to CertainTeed Corporation, Valley Forge, Pa.
Filed Jan. 13, 1989, Ser. No. 297,262
Term of patent 14 years
U.S. Cl. D25—124



307,485
WINDOW COMPONENT EXTRUSION
Dennis Westphal, Galva, and Jonathan Piles, McPherson, both of Kans., assignors to CertainTeed Corporation, Valley Forge, Pa.
Filed Jan. 13, 1989, Ser. No. 297,533
Term of patent 14 years
U.S. Cl. D25—124



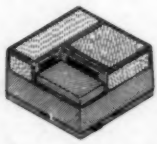
307,486
DESIGN FOR A WINDOW COMPONENT EXTRUSION
Dennis Westphal, Galva, and Jonathan Piles, McPherson, both of Kans., assignors to CertainTeed Corporation, Valley Forge, Pa.
Filed Jan. 13, 1989, Ser. No. 297,672
Term of patent 14 years
U.S. Cl. D25—124

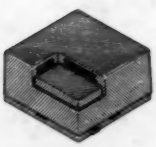


307,487
LAMP
Raymond J. Noe, Highland Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.
Filed Nov. 14, 1986, Ser. No. 930,826
Term of patent 14 years
U.S. Cl. D26—2

307,488
FLASHLIGHT
Raymond L. Sharrah, Collegeville, Pa., assignor to Streamlight, Inc., Norristown, Pa.
Filed May 6, 1987, Ser. No. 46,947
Term of patent 14 years
U.S. Cl. D26—49

307,489
CONTAINER FOR RELEASING PERFUME
Tadao Watanabe, Suita, Japan, assignor to DIA Chemical Co., Ltd., Japan
Filed Mar. 14, 1988, Ser. No. 167,519
Claims priority, application Japan, Sep. 17, 1987, 62-38066; Sep. 17, 1987, 62-38067
Term of patent 14 years
U.S. Cl. D28—5



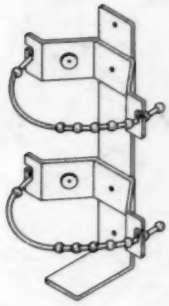


307,490
SUNTAN LOTION APPLICATOR
Alan J. Thieroff, Jr., 530 Winchester Rd., Warminster, Pa. 18974; Larry T. Kaplan, 72 Kingsclere Rd., Southampton, Pa. 18966, and Andrew Banchi, 685 Cheryl Dr., Warminster, Pa. 18974
Filed May 23, 1989, Ser. No. 355,375
Term of patent 14 years
U.S. Cl. D28—7

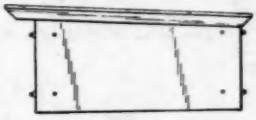
307,491
COMBINED ELECTRIC SHAVER AND CAP THEREFOR
Eiji Okada, Nakanobu 5-5-12, Shinagawa-ku, Tokyo, Japan
Filed Aug. 7, 1987, Ser. No. 83,833
Claims priority, application Japan, Jun. 16, 1987, 62-024346
Term of patent 14 years
U.S. Cl. D28—50

307,492
CUTICLE TREATMENT KIT
James H. S. Whitney, 114 Fairway Dr., Harrisonburg, Va. 22801
Filed May 16, 1988, Ser. No. 217,892
Term of patent 14 years
U.S. Cl. D28—61

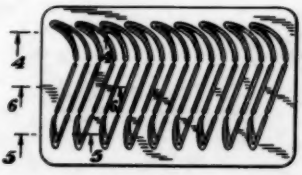
307,494
FIRE EXTINGUISHER MOUNTING BRACKET
Fred B. Goodnight, Leeds, Ala., assignor to Amerex Corporation, Trussville, Ala.
Filed Jun. 11, 1987, Ser. No. 60,440
Term of patent 14 years
U.S. Cl. D29—5

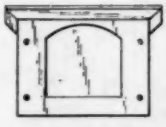


307,495
PET SHELTER
Clifford K. Logan, Jr., 9810 Hefner Village Blvd., Oklahoma City, Okla. 73132
Filed Jun. 5, 1987, Ser. No. 58,541
Term of patent 14 years
U.S. Cl. D30—108

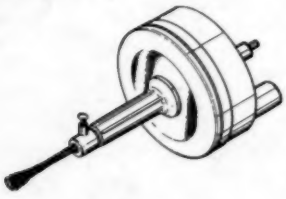


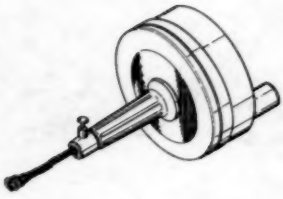
307,493
FLAT TOOTHPICK DISPENSER CARD
Peter S. C. Cheng, 5 Ross Street, Toronto, Ontario, Canada (M5T 1Z8)
Filed Nov. 3, 1988, Ser. No. 266,626
Term of patent 14 years
U.S. Cl. D28—64



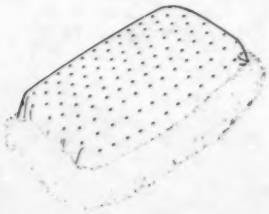


307,496
AUGER HOUSING
Nicholas W. Moss, 1905 Country Club Dr., Cherry Hill, N.J. 08003
Filed Dec. 4, 1986, Ser. No. 938,175
Term of patent 14 years
U.S. Cl. D32—14



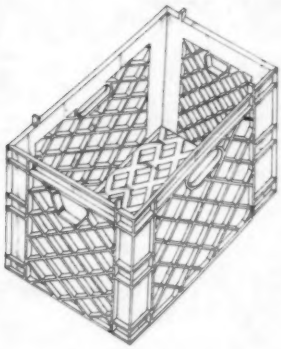


307,497
CHAMOIS AND PILE COVERED SPONGE
Michael A. Giallourakis, Tarpon Springs, Fla., assignor to Sponge Fishing Co., Inc., Tarpon Springs, Fla.
Filed Jun. 5, 1987, Ser. No. 58,538
Term of patent 14 years
U.S. Cl. D32—40

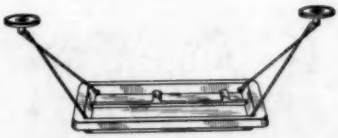


307,498
VEHICLE LIFT
Yusuke Kawana, Otowa, Japan, assignor to Sugiyasu Industries Co., Ltd., Aichi, Japan
Filed Feb. 3, 1988, Ser. No. 152,081
Claims priority, application Japan, Dec. 3, 1987, 62-49644
Term of patent 14 years
U.S. Cl. D34—31

307,499
BEVERAGE CASE
Thomas Box, Tinton Falls, N.J., assignor to Spectrum International, Inc., Tinton Falls, N.J.
Filed Aug. 17, 1987, Ser. No. 86,653
Term of patent 14 years
U.S. Cl. D34—43



307,500
TOOL TRAY
Scott Mullaly, 7928 Bacadi Dr., San Diego, Calif. 92126
Filed Jul. 3, 1986, Ser. No. 881,711
Term of patent 14 years
U.S. Cl. D34—45

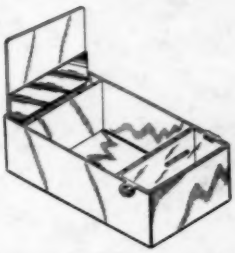


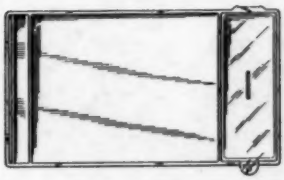
307,501
ROSARY
Donald J. Abel, 712 Summit Ave., Franklin Lakes, N.J. 07417
Filed Nov. 13, 1984, Ser. No. 670,265
Term of patent 14 years
U.S. Cl. D99—26

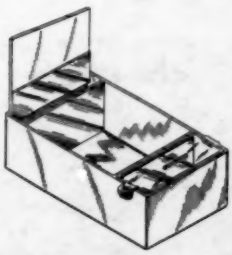
307,502
ROSARY
Daniel T. Mielnicki, 303 Hacienda Cir., Haughton, La. 71037
Filed Mar. 18, 1987, Ser. No. 27,025
Term of patent 14 years
U.S. Cl. D99—26

307,503
COIN COLLECTOR
Stevan M. Divnick, Spring Valley, Ohio, assignor to Divnick International, Inc., Spring Valley, Ohio
Filed Mar. 23, 1987, Ser. No. 29,491
Term of patent 14 years
U.S. Cl. D99—34

307,504
COMBINED CONFECTIONERY TRAY, ADVERTISING HOLDER AND DONATION BOX
Charles E. Silcox, Rte. #3, Box 499, Proctorville, Ohio 45669
Continuation-in-part of Ser. No. 886,508, Jul. 16, 1986. This application Oct. 17, 1986, Ser. No. 921,011
The portion of the term of this patent subsequent to Nov. 14, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D99—36







LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 24TH DAY OF APRIL, 1990

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Corporation: *See*—
Frejborg, Frey A., 4,918,807, Cl. 29-163.800.
Kokkonen, Seppo K.; and Qvintus, Harri T., 4,919,158, Cl. 134-15.000.
Vikio, Pentti A., 4,919,796, Cl. 209-211.000.

A 'n D Cable Products, Inc.: *See*—
Chompff, Conrad, 4,919,619, Cl. 439-371.000.

ABB Stromberg Drives OY: *See*—
Mard, Matti; Vauhkonen, Vesa; and Kangasaho, Olavi, 4,920,306, Cl. 318-722.000.

Abba, Rodney L.: *See*—
Parsons, Mark N.; and Abba, Rodney L., 4,919,877, Cl. 264-282.000.

Abe, Hitoshi: *See*—
Nishiyama, Masanobu; Abe, Hitoshi; and Ochi, Yasuo, 4,919,314, Cl. 222-643.000.

Abe, Ichiro: *See*—
Honma, Tohru; Mori, Shigeki; Ohya, Kunihiko; Matsumoto, Shiro; Nakata, Akira; Abe, Ichiro; and Hosaka, Naoto, 4,918,902, Cl. 53-403.000.

Abe, Makoto; Tanimoto, Ichiro; Fujiki, Akira; Suzuki, Keitaro; Endo, Hiroyuki; and Ikenoue, Yutaka, to Nissan Motor Co., Ltd.; and Hitachi Powdered Metals Co., Ltd. High temperature wear resistant sintered alloy. 4,919,719, Cl. 75-243.000.

Abe, Masatoshi; Okamoto, Shin; and Naraki, Akihiro, to Nippon Mektron Limited. Process for producing fluorine-containing elastic copolymer. 4,920,170, Cl. 526-247.000.

Abe, Tomiya: *See*—
Nakakuki, Noboru; Oda, Kazuhide; Tagami, Masatoshi; Okino, Kouichi; Abe, Tomiya; and Ishibashi, Takanobu, 4,919,513, Cl. 350-96.330.

Abe, Tomoaki: *See*—
Ishiguro, Yuji; Hosokawa, Hiroyuki; Koyama, Nobuhiko; Hiramatsu, Eiji; Takao, Mitsunori; Abe, Tomoaki; Kiyono, Masashi; Maeda, Katsuya; and Kamio, Shigeru, 4,919,103, Cl. 123-514.000.

Abe, Tooru: *See*—
Sakai, Yoshiro; Sadaoka, Yoshihiko; Kuroiwa, Takasi; Abe, Tooru; and Miyagishi, Tetsuya, 4,920,451, Cl. 361-286.000.

Abe, Yoshinori; Matsunawa, Masahiko; and Yamamoto, Hiroyuki, to Konishiroku Photo Industry Co., Ltd. Image processing system with capability of enlarging and reducing operations. 4,920,571, Cl. 382-47.000.

Abels, Martin: *See*—
Kurz, Gunter; Abels, Martin; Schwirtlich, Ingo; and Woditsch, Peter, 4,919,913, Cl. 423-348.000.

Abo, Toshimi; Satoh, Hiroshi; and Takahashi, Nobutaka, to Nissan Motor Company, Limited. Fuel monitoring arrangement for automotive internal combustion engine control system. 4,920,494, Cl. 364-431.050.

Absil, Robert P. L.; Chang, Clarence D.; Chu, Cynthia T-W.; and Klocke, Donald J., to Mobil Oil Corporation. Method for hydrocarbon dewaxing utilizing a reactivated spent MTG zeolite catalyst. 4,919,790, Cl. 208-78.000.

ABU Garcia Produktion AB: *See*—
Johansson, Arne, 4,919,362, Cl. 242-303.000.

Abu-Shumays, Ibrahim K.; and Abu-Shumays, Mary D. Dual sun visors. 4,919,468, Cl. 296-97.400.

Abu-Shumays, Mary D.: *See*—
Abu-Shumays, Ibrahim K.; and Abu-Shumays, Mary D., 4,919,468, Cl. 296-97.400.

Acec Transport S.A.: *See*—
Bonhomme, Henri, 4,920,448, Cl. 361-102.000.

Achterman, Kermit L.: *See*—
Bates, H. John; Achterman, Kermit L.; Gearin, Peter; and Halpin, Terence, 4,919,582, Cl. 414-233.000.

Ackerman, James H.: *See*—
Bell, Malcolm R.; and Ackerman, James H., 4,920,128, Cl. 514-293.000.

Acry Industries, Incorporated: *See*—
Whitenack, Joan E.; Sanchez, George; Stone, Earlyn W.; and Colton, Buddy A., 4,920,251, Cl. 219-401.000.

Acutronic France: *See*—
Perdriat, Jacques, 4,919,646, Cl. 494-1.000.
Perdriat, Jacques, 4,920,303, Cl. 318-161.000.

Adachi, Keiichi: *See*—
Ohno, Shigeru; Inagaki, Yoshio; Adachi, Keiichi; and Momoki, Yasuhito, 4,920,031, Cl. 430-522.000.

Adachi, Osamu: *See*—
Kimura, Takashi; Chihara, Kenichi; Tomatsu, Masahiro; Inoue, Kazunobu; Yano, Norio; and Adachi, Osamu, 4,920,441, Cl. 360-133.000.

Adachi, Ryoichi; and Muraoka, Shyuji, to Mazda Motor Corporation. Automobile front body structure. 4,919,474, Cl. 296-194.000.

Adachi, Ryoichi: *See*—
Shibata, Mitsuru; Hiramatsu, Yoshiyuki; Adachi, Ryoichi; and Mitsutake, Kenichiro, 4,919,705, Cl. 71-90.000.

Adams, Alan D.: *See*—
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Adams, Gerd: *See*—
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Adams, Keith D.; Gruenbacher, Dana P.; and Noble, Kathleen H., to Procter & Gamble Company, The. Shelf stable, highly aerated reduced calorie food products. 4,919,964, Cl. 426-564.000.

Adams, Martha S.: *See*—
Keller, Stephen A.; Spry, Piper A.; Adams, Martha S.; and Harper, Ralph G., 4,920,072, Cl. 437-192.000.

Adelmann, Harry W.; and Tomcik, James D., to AT&T Bell Laboratories. System for controllably eliminating bits from packet information field based on indicator in header and amount of data in packet buffer. 4,920,534, Cl. 370-94.100.

Ademmer, Heinz: *See*—
Weigel, Peter; Holland-Letz, Guenter; Ademmer, Heinz; and Nottelmann, Ulrich, 4,919,412, Cl. 271-110.000.

Adlhoch, Wolfgang H.: *See*—
Lambertz, Johannes; Adlhoch, Wolfgang H.; Mittelstadt, Alfred G.; and Hermann, Wolfgang, 4,919,687, Cl. 48-62.00R.

Adolph Coors Company: *See*—
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Young, David C.; and Willcoxen, Mark A., 4,919,310, Cl. 222-386.500.

Advanced Fiber Technology, Inc.: *See*—
Gerber, Milton, 4,919,340, Cl. 241-5.000.

Aerospatiale Societe Nationale Industrielle: *See*—
Martin, Gerard M.; Claramonte, Manuel P.; Auffret, Jean-Claude; Bonnet, Guy M.; and Delarue, Jean-Jacques, 4,919,900, Cl. 422-245.000.
Rollet, Robert, 4,918,985, Cl. 73-471.000.

AG Processing Technologies, Inc.: *See*—
Nulman, Jaim; Bacile, Nick J.; and Blonigan, Wendell T., 4,919,542, Cl. 374-9.000.

Agarwala, Ashok K., to Eastman Kodak Company. Method of magnetizing high energy rare earth alloy magnets. 4,920,326, Cl. 335-284.000.

Agbay, Albert J., Sr., to Robert Linkletter Assoc. Hinged closure and container. 4,919,286, Cl. 215-235.000.

Agence Spatiale Europeenne: *See*—
Cable, Neil, 4,919,627, Cl. 439-263.000.

Agency of Industrial Science & Technology, Ministry of International Trade & Industry: *See*—
Nakao, Yukimichi; Kaeriyama, Kyoji; and Yamauchi, Aizo, 4,919,716, Cl. 423-658.500.

Agfa-Gevaert Aktiengesellschaft: *See*—
Huber, Leonhard; Nagel, Erich; Payrhammer, Bernd; Lermann, Peter; Treiber, Helmut; and Wilsch, Herbert, 4,919,354, Cl. 242-67.30R.

Aggarwal, Bharat B., to Genentech, Inc. Human lymphotoxin. 4,920,196, Cl. 530-351.000.

Ahlskog, Sture: *See*—
Ruottu, Reijo; Rajala, Raimo; Jokioinen, Ilkka; and Ahlskog, Sture, 4,918,828, Cl. 34-4.000.

Ahmed, Salah H.; Kadlec, John D.; and Luksas, Anthony J., to Dairy Research, Inc. Process of making a carbonated liquid dairy product. 4,919,960, Cl. 426-580.000.

Aiba, Masahiko, to Sharp Kabushiki Kaisha. Optical printer of scaning type. 4,919,499, Cl. 350-6.600.

Aida Engineering, Ltd.: *See*—
Ishinaga, Nobuyuki, 4,918,967, Cl. 72-354.000.
Ishinaga, Nobuyuki, 4,918,970, Cl. 72-354.000.

Aiki, Kunio; Sasayama, Atsushi; Nemoto, Tugio; Haneda, Makoto; Ishii, Satoru; Kugimiya, Haruo; and Kawasaki, Tutomu, to Hitachi, Ltd.; and Hitachi Tobu Semiconductor. Photoelectric device with leads. 4,920,262, Cl. 250-227.110.

Air-Lec Industries, Inc.: *See*—
Lunenschloss, John T.; Ebbott, Henry M.; Beckeman, Raymond A.; and Gregerson, Glen M., 4,918,864, Cl. 49-137.000.

Air Products and Chemicals, Inc.: *See*—
Wang, Shoou-I, 4,919,844, Cl. 252-373.000.

Air Techniques, Incorporated: *See*—
Alzner, Edgar, 4,919,826, Cl. 210-788.000.

Airshield Corporation: *See*—
Wiley, Nathaniel C., Jr., 4,919,472, Cl. 296-180.200.

Aisin-Aw Kabushiki Kaisha: *See*—
Sakakibara, Shiro; Miyaishi, Yoshinori; and Kano, Yoshiaki, 4,919,645, Cl. 474-245.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Nakano, Toshihiro; Sakata, Shinji; Ichioka, Hitoshi; Minagawa, Kiyohiko; and Iijima, Hideaki, 4,918,922, Cl. 60-589.000.

Aizawa, Genya; and Ono, Kakuhisa. Auxiliary sun visor for automobile. 4,919,469, Cl. 296-97.600.

Aizawa, Makoto: *See*—
Yamane, Takakazu; Tanimoto, Yoshio; Nakahama, Tadamitsu; Aizawa, Makoto; and Kishimoto, Tsuneo, 4,919,977, Cl. 427-379.000.

Ajikan Co. Ltd.: *See*—
Hosaka, Hideaki; Nakatani, Noboru; Aoki, Kiyotaka; and Shimaoka, Koichi, 4,919,959, Cl. 426-574.000.

Akada, Yasuaki: *See*—
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Akamatsu, Shogo: *See*—
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Akao, Kiyoshi: *See*—
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Akao, Michitoshi; Sakakibara, Kenji; Katoh, Tokunori; Sawaki, Yukichi; Sonoda, Takakuni; and Suzuki, Makoto, to Brother Kogyo Kabushiki Kaisha. Imaging device. 4,920,375, Cl. 355-27.000.

Akao, Michitoshi: *See*—
Sangyoji, Kazuo; Yamamoto, Takemi; Okamoto, Tsugio; Hatta, Naoyuki; Asano, Yuji; Sakakibara, Kenji; Nakai, Hitoshi; Akao, Michitoshi; Sakai, Jun; and Matsumoto, Yumio, 4,920,374, Cl. 355-27.000.

Akasaka, Michio. Hardware assembly for mounting coping. 4,918,892, Cl. 52-300.000.

Akebono Brake Industry Co., Ltd.: *See*—
Yamazaki, Kimihiro, 4,919,237, Cl. 188-79.620.

Akiyama, Hitoshi: *See*—
Sumita, Masaya; and Akiyama, Hitoshi, 4,919,751, Cl. 156-646.000.

Ako, Shigeich, to Matsushima Engineering Co., Ltd. Method and apparatus for producing a bag-in-carton. 4,918,906, Cl. 53-449.000.

Akzo N.V.: *See*—
Meijer, John; Torenbeek, Reinder; and van den Berg, Rolf H., 4,919,836, Cl. 252-94.000.
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Albert-Frankenthal AG: *See*—
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Albonesi, David, to Prime Computer, Inc. Memory error correction system. 4,920,539, Cl. 371-40.200.

Albrecht, Klaus; Hans, Helmut; von der Heide, Johann; and Schmider, Fritz, to Papst-Motoren GmbH & Co. KG. Motor having rotor capable of both stepped rotary and axial shift motions. 4,920,292, Cl. 310-114.000.

Albright & Wilson Limited: *See*—
Jones, Mervyn F., 4,919,725, Cl. 106-218.000.
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Alexander, Dennis W., to Rexworks Inc. Multiple section chute restrictor. 4,919,249, Cl. 193-6.000.

Alexander, Herman P.; and Langwell, John D., to Sandy Alexander, Inc. Sheet dispenser and display and holder therefor. 4,919,377, Cl. 248-225.100.

Alexander, William, to American Colloid Company. Process for extruding and treating clay for improved filtration. 4,919,818, Cl. 210-660.000.

Alexeff, Igor: *See*—
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ALH Systems Limited: *See*—
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Alkan, M. Hayat; and Groves, Michael J., to University of Illinois, Board of Trustees of the. Coating apparatus for small-scale processing. 4,919,973, Cl. 427-213.000.

Allard, John J.; Kemp, Merle L.; and Janicek, Alan J., to General Electric Company. Method of assembling an electronic transducer. 4,918,833, Cl. 29-621.100.

Allegheny Ludlum Corporation: *See*—
Gembarosky, Michael P.; Clark, Gary S.; Baybrook, Howard E.; and Trudgeon, Arthur E., 4,919,465, Cl. 294-67.200.
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Allen, Richard B.; Gibbs, William E.; and Hans, Lynn M., to General Electric Company. Expandable thermoplastic resin beads. 4,920,153, Cl. 521-60.000.

Allen, Theresa M.; and Gabizon, Alberto, to Linear Technology, Inc. Liposomes with enhanced circulation time. 4,920,016, Cl. 424-450.000.

Allfast Fastening Systems, Inc.: *See*—
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Allied-Signal Inc.: *See*—
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Swedo, Raymond J.; and Zupancic, Joseph J., 4,919,808, Cl. 210-490.000.
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Allies-Signal Inc.: *See*—
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Allkins, Martin D., to British Telecommunications public company limited. Moisture barrier assembly. 4,920,564, Cl. 379-437.000.

Allsop, Inc.: *See*—
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Allworth, Peter C.: *See*—
Feingold, Vladimir; and Allworth, Peter C., 4,919,650, Cl. 604-67.000.

Alopex Industries, Inc.: *See*—
Sargent, Ronald J., 4,920,465, Cl. 362-96.000.

Alpha, Anthony J. Pencil sharpener. 4,918,816, Cl. 30-452.000.

Alpha Therapeutic Corporation: *See*—
Heidebrant, Charles M.; Crowe, Kim C.; Groveman, George R.; and Davis, Charles H., Jr., 4,919,895, Cl. 422-129.000.

Alps Electric Co., Ltd.: *See*—
Aoki, Tsuyoshi; and Ohsumi, Yasuhisa, 4,920,341, Cl. 341-15.000.
Furukawa, Masatoshi; and Kobayshi, Kazuo, 4,920,438, Cl. 360-104.000.
Takano, Yasunari; and Okada, Mitsuhiro, 4,920,245, Cl. 200-533.000.
Yamaguchi, Kiichi; and Itoh, Takehiko, 4,919,620, Cl. 439-15.000.
Yuge, Tadashi, 4,920,243, Cl. 200-314.000.

Alt, Eckhard. Ventilation controlled rate responsive cardiac pacemaker. 4,919,136, Cl. 128-419.00P.

Alter, Konrad G.; and Griffiths, Jennifer D., to Nujenko Pty. Ltd. Syringe. 4,919,652, Cl. 604-110.000.

Alvarez, Joseph L.; and Watson, Lloyd D., to United States of America, Energy. Apparatus and method for spraying liquid materials. 4,919,853, Cl. 264-12.000.

Alvin Lee Jewelry, Inc.: *See*—
Lee, Yeou-Ching, 4,918,847, Cl. 40-152.100.

Alward, Philander N.: *See*—
Innocenti, Emil, Sr.; and Alward, Philander N., 4,919,358, Cl. 242-68.400.

Alzner, Edgar, to Air Techniques, Incorporated. Process and apparatus for separating solids and liquids from an effluent stream. 4,919,826, Cl. 210-788.000.

Amada Company, Limited: *See*—
Tobita, Chuo; and Matsuno, Eiji, 4,919,028, Cl. 83-153.000.

Amamiya, Shoji: *See*—
Sakakibara, Teigo; Sakai, Kiyoshi; Sakoh, Harumi; and Amamiya, Shoji, 4,920,022, Cl. 430-59.000.

Amaya, Toshiyuki: *See*—
Hosaka, Sumio; Amaya, Toshiyuki; Daito, Toshiji; Itoh, Hiroshi; and Jinguji, Takumi, 4,920,424, Cl. 358-343.000.

Ambier, Jean; Francillon, Marie-Jo; Allibert, Colette; and Laugee, Catherine, to Merlin Gerin. Sintered composite material for electrical contact. 4,919,717, Cl. 75-228.000.

Amdahl Corporation: *See*—
Hammond, Gary N.; Taylor, Michael D.; and Taylor, Nongnuch, 4,920,536, Cl. 371-10.100.
Vahidsafa, Ali, 4,920,485, Cl. 364-200.000.

Amemiya, Shigeo: *See*—
Iguchi, Kazuo; Soejima, Tetsuo; Murano, Kazuo; Amemiya, Shigeo; Komine, Hiroaki; Watanabe, Toshiaki; and Shinomiya, Tomohiro, 4,920,546, Cl. 375-106.000.

Amemori, Hiroyuki: *See*—
Kato, Takashi; Morita, Yutaka; Yamaguchi, Takeshi; Tsuge, Kazuo; Imamura, Kyoji; Kawai, Yoshio; Hasegawa, Hiroaki; and Amemori, Hiroyuki, 4,918,996, Cl. 73-861.910.
American Biogenetics Corporation: *See*—
Hoiberg, Dane A.; Hatfield, G. Wesley; Moyed, Harris S.; and Sharp, Janice A., 4,920,055, Cl. 435-147.000.
American Colloid Company: *See*—
Alexander, William, 4,919,818, Cl. 210-660.000.
Colangelo, Robert V., 4,919,989, Cl. 428-65.000.
American Cyanamid: *See*—
Los, Marinus; Ladner, David W.; and Cross, Barrington, 4,920,226, Cl. 546-80.000.
American Cyanamid Company: *See*—
Markowicz, Marion, 4,919,304, Cl. 222-3.000.
Valentine, Donald, Jr.; and Brown, Duncan W., 4,920,068, Cl. 437-81.000.
American Home Products Corporation: *See*—
Davis, Alan R.; and Hung, Paul P., 4,920,209, Cl. 435-235.000.
Moyer, John A., 4,920,121, Cl. 514-255.000.
American Maize-Products Company: *See*—
Friedman, Robert B., 4,920,214, Cl. 536-103.000.
American Protective Equipment, Inc.: *See*—
Mitchell, Hal D., 4,919,037, Cl. 89-36.050.
American Saw & Mfg. Company: *See*—
Korb, William B.; and Koetsch, Paul W., 4,918,820, Cl. 30-161.000.
American Screen Printing Company: *See*—
Bubley, Henry J.; and Motev, Phil, 4,919,043, Cl. 101-123.000.
American Standard Inc.: *See*—
Gandini, Luigi, 4,918,769, Cl. 4-661.000.
American Tourister, Inc.: *See*—
Phillips, Kenneth A., 4,919,280, Cl. 211-87.000.
Ammerman, Stephen W.: *See*—
Cline, Jack B.; and Ammerman, Stephen W., 4,919,655, Cl. 604-110.000.
Amoco Corporation: *See*—
Bandurski, Eric L.; Vu, Phach F. N.; and Bruce, Gary D., 4,919,893, Cl. 422-78.000.
Harms, Susan D., 4,919,827, Cl. 252-8.553.
AMP Incorporated: *See*—
Billman, Timothy B.; and Goodman, Joseph R., 4,919,623, Cl. 439-70.000.
Bowen, Terry P.; Deeg, Emil W.; Helm, James G.; and Stauffer, Larry R., 4,920,366, Cl. 350-96.200.
Ampex Corporation: *See*—
Andrews, James H., 4,920,440, Cl. 360-132.000.
Ams, Felix, to Richard Wolf, GmbH. Plug and socket type connector for connecting an endoscope to supply units. 4,919,621, Cl. 439-191.000.
Analgesic Associates: *See*—
Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., 4,920,149, Cl. 514-557.000.
Anand, Joginder N.: *See*—
Ruetman, Sven H.; Anand, Joginder N.; and Collins, G. Robert, 4,920,167, Cl. 524-155.000.
Anazawa, Takanori; Hasumi, Kazuo; and Ono, Yoshiyuki, to Dainippon Ink and Chemicals, Inc. Process for producing membranes for use in gas separation. 4,919,856, Cl. 264-22.000.
Andersen, John A.: *See*—
Haskett, Wayne J.; Andersen, Leonard; and Andersen, John A., 4,919,287, Cl. 211-41.000.
Andersen, Leonard: *See*—
Haskett, Wayne J.; Andersen, Leonard; and Andersen, John A., 4,919,287, Cl. 211-41.000.
Andersen, Ole. Game board with player figures for teaching team sports. 4,919,618, Cl. 434-251.000.
Anderson, Clyde: *See*—
Vara, Tomas E.; and Anderson, Clyde, 4,919,692, Cl. 55-59.000.
Anderson, Ernest R.; and Gahan, John K. Timekeeping cap. 4,918,759, Cl. 2-199.000.
Anderson, Kristy L.; and Bollinger, Edward R., to RJ Lee Group, Inc. Shipping device. 4,919,300, Cl. 220-408.000.
Anderson, Richard N. Structure for securing composite members together. 4,918,810, Cl. 29-798.000.
Andoh, Kazuto: *See*—
Ohki, Nobutaka; Andoh, Kazuto; and Ishikawa, Takatoshi, 4,920,041, Cl. 430-380.000.
Andreas Stihl: *See*—
Wissmann, Michael; Schleimann, Harald; and Weber, Jurgen, 4,919,091, Cl. 123-179.0BG.
Andree, Hans: *See*—
Vogt, Guenther; Andree, Hans; and Nienhaus, Gertrud, 4,919,845, Cl. 252-526.000.
Andrews, George F., to Interamerican Industrial Company. Electronic article surveillance device with remote deactivation. 4,920,335, Cl. 340-572.000.
Andrews, James H., to Ampex Corporation. Composite lid assembly. 4,920,440, Cl. 360-132.000.
Andrews, John R.; Haas, Werner E.; and Guerin, Jean-Michel, to Xerox Corporation. Liquid crystal dynamic attenuator for laser printers. 4,920,364, Cl. 346-160.000.
Anelva Corporation: *See*—
Asamaki, Tatsuo; Mito, Hideo; Nakagawa, Yukito; and Sekiguchi, Atsushi, 4,919,783, Cl. 204-298.160.
Anhalt, John W.; and Goodman, David S., to ITT Corporation. Connector for IC card. 4,919,626, Cl. 439-260.000.
Ansmann, Achim: *See*—
Hoeffkes, Horst; Lange, Fritz; and Ansmann, Achim, 4,919,923, Cl. 424-70.000.
Anthony, James R.: *See*—
Bougher, Jerry D.; Anthony, James R.; Williams, Jeffrey L.; Homeier, Ronald F.; and Lortz, Allan R., 4,919,484, Cl. 297-474.000.
Anthony, William M.; and Ringger, Hans R., to Allied-Signal Inc. Torque transmitting member. 4,919,562, Cl. 403-16.000.
Antonious, Anthony J. Golf club head. 4,919,430, Cl. 273-169.000.
Antonious, Anthony J. Golf club head. 4,919,431, Cl. 273-169.000.
Antonowitz, Frank P. Vent actuator. 4,920,304, Cl. 318-466.000.
Antons, Peter; and Antons, Samra L. Disposable tooth color shade guide. 4,919,617, Cl. 433-26.000.
Antons, Samra L.: *See*—
Antons, Peter; and Antons, Samra L., 4,919,617, Cl. 433-26.000.
Aoki, Kiyotaka: *See*—
Hosaka, Hideaki; Nakatani, Noboru; Aoki, Kiyotaka; and Shimaoka, Koichi, 4,919,959, Cl. 426-574.000.
Aoki, Masayuki, to Kabushiki Kaisha Toshiba. High frequency heating apparatus using microcomputer controlled inverter. 4,920,246, Cl. 219-10.55B.
Aoki, Shigeo, to Kabushiki Kaisha Toshiba. Operational information display system. 4,920,514, Cl. 364-521.000.
Aoki, Takatoshi: *See*—
Fujiyoshi, Yoshihiro; Nagase, Hidenobu; Fukuo, Koichi; and Aoki, Takatoshi, 4,919,089, Cl. 123-90.160.
Aoki, Tsuyoshi; and Ohsumi, Yasuhisa, to Alps Electric Co., Ltd. Magnetic rotary encoder device. 4,920,341, Cl. 341-15.000.
Aoki, Yoshio: *See*—
Kadono, Yasuo; Koga, Masaaki; and Aoki, Yoshio, 4,920,010, Cl. 428-570.000.
Aomoto, Benso: *See*—
Kurihara, Toshiyuki; Aomoto, Benso; and Nishio, Ko, 4,919,074, Cl. 118-697.000.
Aoshima, Shinichiro; and Tsuchiya, Yutaka, to Hamamatsu Photonics Kabushiki Kaisha. Voltage detector. 4,920,310, Cl. 324-96.000.
Aouda, Yukio; Ninomiya, Hiroshi; Izu, Genichi; Yazawa, Yuichi; and Tachibana, Megumi, to Nippon Kayaku Kabushiki Kaisha. Nitroglycerin spray. 4,919,919, Cl. 424-45.000.
Aparicio, Facundo: *See*—
Grace, Kenneth P.; and Aparicio, Facundo, 4,919,508, Cl. 350-96.200.
Aqualon Company: *See*—
Banyai, Bruce E.; LaSota, Denis E.; and Struck, Dennis L., 4,919,711, Cl. 75-321.000.
Arabori, Hideo: *See*—
Shida, Takafumi; Arabori, Hideo; Watanabe, Takeo; Kanda, Yohichi; Yamazaki, Shiro; and Shinkawa, Hiroyasu, 4,919,707, Cl. 71-92.000.
Arahara, Kohzoh; Fukumoto, Hiroshi; Yuasa, Toshiya; Ohnishi, Toshikazu; Kan, Fumitaka, deceased (by Kan, Akiko, legal successor); Tanioka, Hiroshi; Koizumi, Norihiko; and Tohyama, Noboru, to Canon Kabushiki Kaisha. Image recording method and apparatus therefor. 4,920,361, Cl. 346-140.00R.
Arai, Akihiro; and Shono, Tetsuji, to Asahi Kogaku Kogyo Kabushiki Kaisha. Built-in flash system. 4,920,368, Cl. 354-145.100.
Arai, Fuminori; and Osada, Fusae, to Fuji Photo Film Co., Ltd. Dry type analysis element. 4,919,890, Cl. 422-56.000.
Arai, Tatsuo: *See*—
Tsujimura, Osamu; Arai, Tatsuo; and Okawa, Masayuki, 4,919,573, Cl. 407-40.000.
Arai, Yuji; Hamada, Emiko; Shin, Yuaki; and Ishiguro, Takashi, to Taiyo Yuden Co., Ltd. Optical information recording medium having protective layer. 4,920,359, Cl. 346-137.000.
Arakawa, Tadao: *See*—
Tateishi, Akitaka; Arakawa, Tadao; Kurosawa, Masaru; Kubo, Yoshifumi; and Nagai, Yoji, 4,920,276, Cl. 290-2.000.
Arata, Masami: *See*—
Sakashita, Takeshi; Honda, Narimichi; and Arata, Masami, 4,920,188, Cl. 526-196.000.
Arcelli & Bernacchi Srl.: *See*—
Bellazzi, Emilio, 4,919,682, Cl. 24-20.00R.
Arikawa, Hiroo; and Yuza, Yasutada, to SOC Corporation. Chip-type micro-fuse. 4,920,327, Cl. 337-231.000.
Arima, Itsuo: *See*—
Ochiai, Kumi; Horie, Hiromichi; Arima, Itsuo; and Morita, Mikio, 4,919,734, Cl. 148-306.000.
Arita, Yoshinobu: *See*—
Sakai, Tetsushi; Kobayasi, Yoshizi; Yamauchi, Hironori; and Arita, Yoshinobu, 4,920,401, Cl. 357-59.000.
Armstrong, Desmond R., to U.S. Philips Corporation. Amplifier circuit arrangement. 4,920,321, Cl. 330-257.000.
Armstrong, Robert N.: *See*—
Tyler, Robert A.; Ramsey, Henry C.; and Armstrong, Robert N., 4,919,681, Cl. 8-116.100.
Arnone, Gaetano J., to United States of America, Energy. Multiple channel programmable coincidence counter. 4,920,271, Cl. 250-390.010.
Arona-Delonghi, Adriano G., to Fabricacion De Maquinas, S.A. Cap for collapsible bottles and the like. 4,919,309, Cl. 222-153.000.
Aronowitz, Frederick: *See*—
Vescial, Frederick; and Aronowitz, Frederick, 4,918,987, Cl. 73-517.00B.

Arora, Vijay K.; Jones, Gary V.; Kovtun, John M.; and Brandlein, Lawrence S., to General Foods Corporation. Coffee flakes and process. 4,919,962, Cl. 426-594.000.

Arp, George F. Core pinch-off for blow molding parison. 4,919,880, Cl. 264-536.000.

Artigue, Claude: *See—*
Brosson, Philippe; Jacquet, Joel; Artigue, Claude; Leclerc, Denis; and Benoit, Jacques, 4,920,542. Cl. 372-50.000.

Artus, Kevin J.: *See—*
Dewar, Colin A.; and Artus, Kevin J., 4,919,996, Cl. 428-221.000.

Arzoian, John: *See—*
Trachman, Edward G.; Shih, Shan; and Arzoian, John, 4,919,010, Cl. 475-281.000.

Asahi Chemical Polyflex: *See—*
Kai, Hisao; and Nakashima, Kiyoshi, 4,919,272, Cl. 206-620.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Yamamoto, Takuya; Fushimi, Fumiyoshi; and Nishikido, Jyoji, 4,919,809, Cl. 210-500.230.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Arai, Akihiro; and Shono, Tetsuji, 4,920,368, Cl. 354-145.100.
Iketani, Kohei, 4,920,307, Cl. 320-28.000.
Sumita, Masaya; and Akiyama, Hitoshi, 4,919,751, Cl. 156-646.000.

Asai Germanium Research Institute Co., Ltd.: *See—*
Kakimoto, Norihiro; Kumano, Kazuo; and Nakamura, Kunie, 4,919,917, Cl. 424-10.000.

Asai, Tamio; and Maruhashi, Yoshitsugu, to Toyo Seikan Kaisha, Ltd. Coated styrene resin container and process for production thereof. 4,919,985, Cl. 428-36.600.

Asai, Tamio: *See—*
Maruhashi, Yoshitsugu; Asai, Tamio; Iida, Setsuko; and Hirata, Sadao, 4,919,984, Cl. 428-36.400.

Asakura, Tsutou: *See—*
Takanashi, Itsuo; Nakagaki, Shintaro; Shinonaga, Hirohiko; Asakura, Tsutou; and Furuya, Masato, 4,920,417, Cl. 358-209.000.

Asamaki, Tatsuo; Mito, Hideo; Nakagawa, Yukito; and Sekiguchi, Atsushi, to Anelva Corporation. Apparatus for processing an object by gas plasma with a reduced damage. 4,919,783, Cl. 204-298.160.

Asami, Masahiro: *See—*
Waki, Kokichi; Asami, Masahiro; and Shibata, Yoshinori, 4,920,042, Cl. 430-380.000.

Asano, Yuji: *See—*
Sangyoji, Kazuo; Yamamoto, Takemi; Okamoto, Tsugio; Hatta, Naoyuki; Asano, Yuji; Sakakibara, Kenji; Nakai, Hitoshi; Akao, Michitoshi; Sakai, Jun; and Matsumoto, Yutnio, 4,920,374, Cl. 355-27.000.

Asao, Keizo: *See—*
Takahashi, Yasuhiko; Tamura, Kunimitsu; Niimura, Nagato; Asao, Keizo; Honoki, Teruyosi; Masui, Tadaaki; and Ishizaka, Masuo, 4,918,977, Cl. 73-40.50R.

Asao, Kouichiro: *See—*
Ohmae, Tadayuki; Mashita, Kentaro; Yamaguchi, Noboru; Asao, Kouichiro; Kondo, Norio; and Sakurai, Tadashi, 4,919,757, Cl. 162-164.300.

Ashdown, Michael B.: *See—*
Martensson, Nils E. V.; and Ashdown, Michael B., 4,920,352, Cl. 343-702.000.

Ashley, Eddie L. Slab-stem unit forming a trafficway. 4,918,777, Cl. 14-73.000.

Askin, David; Jones, Todd K.; Reamer, Robert A.; Volante, Ralph P.; and Shinkai, Ichiro, to Merck & Co., Inc. Novel hydroxide mediated FK-506 rearrangement process. 4,920,218, Cl. 540-456.000.

ASMO Co., Ltd.: *See—*
Kamimura, Takeshi; and Satoh, Toshihiro, 4,919,591, Cl. 415-152.100.

Aso, Hideo, to Seikosha Co., Ltd. Self-centering switch. 4,920,238, Cl. 200-6.00R.

Aso, Hiroaki. Method of preparing a permanent magnet DC machine. 4,918,830, Cl. 29-596.000.

Aspen Diagnostics Corporation: *See—*
Jones, Lynn A.; Smith, Lloyd H.; and Teng, Nelson N. H., 4,919,889, Cl. 422-40.000.

AT&T Bell Laboratories: *See—*
Adelmann, Harry W.; and Tomcik, James D., 4,920,534, Cl. 370-94.100.
Bredbenner, Craig N.; Giniecki, Troy A.; Selamoglu, Nur; and Stocker, Hans J., 4,919,748, Cl. 156-643.000.
Miller, Calvin M.; Ridgway, David N.; and Sears, Frederick M., 4,919,509, Cl. 350-96.210.

AT&T Philips Telecommunications: *See—*
Ruijs, Jan B. F. W., 4,920,322, Cl. 331-17.000.

AT&T and Philips Telecommunications B.V.: *See—*
Wouda, Kornelis J.; and Tol, Simon J. M., 4,920,530, Cl. 370-32.100.

Atkins, Richard P.: *See—*
Wang, Chen-Shih; Atkins, Richard P.; Eusebi, Elio; and Dearlove, Thomas J., 4,920,161, Cl. 523-220.000.

Atlantic Group, Inc., The: *See—*
Hahn, Robert B., 4,919,199, Cl. 165-162.000.

Atlantic Richfield Company: *See—*
Wiser-Halladay, Robin, 4,920,192, Cl. 528-48.000.

Atochem: *See—*
Lina, Marie-Jose; and Dessaint, Andre, 4,920,190, Cl. 526-288.000.
Masini, Jean-Jacques; and Chabidon, Rene , 4,919,458, Cl. 285-110.000.

Attwood, Michael R.; Crackett, Peter H.; and Lawton, Geoffrey, to Hoffmann-La Roche Inc. Triazine derivatives. 4,920,119, Cl. 514-243.000.

Audi Ag: *See—*
Rauser, Bernard; and Harth, Robert, 4,920,354, Cl. 343-901.000.

Auffret, Jean-Claude: *See—*
Martin, Gerard M.; Claramonte, Manuel P.; Auffret, Jean-Claude; Bonnet, Guy M.; and Delarue, Jean-Jacques, 4,919,900, Cl. 422-245.000.

Aul, Raymond J.; Howell, Robert L.; and Ramsey, Lawrence W., to Westinghouse Electric Corp. Modular nuclear steam supply system and method of constructing a nuclear reactor using a modular nuclear steam supply system. 4,919,882, Cl. 376-293.000.

Australian Telecommunication Corporation: *See—*
Martin, Andrew L., 4,920,543, Cl. 375-10.000.

Austria Metall Aktiengesellschaft: *See—*
Laimighofer, Johann; Garnweidner, Peter; Ublacker, Peter; and Luttinger, Johann, 4,919,473, Cl. 296-188.000.

Automotive Products plc: *See—*
Leigh-Monstevens, Keith V.; and Mabee, Brian D., 4,918,921, Cl. 60-545.000.

Avar, Lajos, to Sandoz Ltd. Oxalic acid di(phenylamides) and use thereof as UV absorbers. 4,920,169, Cl. 524-219.000.

Avco Corporation: *See—*
Naik, Subhash K., 4,919,773, Cl. 204-38.400.

Averback, Paul. Method for detecting the ability to prevent red-to-green congophilic birefringence. 4,919,915, Cl. 424-7.100.

Averill, Robert G.; Zarnowski, Alfred J.; and Lyons, Matthew V., to Osteonics Corp. Femoral stem surgical instrument system. 4,919,679, Cl. 623-23.000.

Avery International Corporation: *See—*
Maria Van Soom, Petrus L. A., 4,919,999, Cl. 428-284.000.

Awata, Bunichiro: *See—*
Tokumasu, Osamu; Kuzuha, Yoshihiro; Suzuki, Hirosi; and Awata, Bunichiro, 4,918,832, Cl. 29-606.000.

Axelrod, Herbert R. Throwable pet toy. 4,919,083, Cl. 119-29.000.

Ayers, Margaret E. Electroencephalic neurofeedback apparatus and method for bioelectrical frequency inhibition and facilitation. 4,919,143, Cl. 128-732.000.

B.A.T. Cigarettenfabriken GmbH: *See—*
Krappitz, Heinz; Wolfel, Herbert; and Wolfrum, Johannes, 4,919,589, Cl. 414-798.900.

B. F. Goodrich Company, The: *See—*
Jorgensen, August H., Jr., 4,920,176, Cl. 525-185.000.
Lai, John Ta-Yuan; and Son, Pyong N., 4,920,228, Cl. 546-224.000.

B.P.T. S.p.A.: *See—*
Plozner, Lisio, 4,920,330, Cl. 340-467.000.

Babcock & Wilcox Company, The: *See—*
Benson, Richard E.; Gavrilos, Andrew D.; Rand, Robert S.; Shaw, Scott M.; Spafford, Joel W.; and Walko, Ronald J., 4,920,305, Cl. 318-657.000.
Manning, Jeffrey L.; and Zurlippe, Clemens F., 4,918,963, Cl. 72-199.000.

Bachmann, Lothar; and Koch, William F. Gas flow diverter. 4,919,169, Cl. 137-875.000.

Bachot, Jean; and Le Roux, Olivier, to Rhone-Poulenc Chimie. Electrolytic cell/process for the reduction of titanium/iron solutions. 4,919,772, Cl. 204-96.000.

Bacile, Nick J.: *See—*
Nulman, Jaim; Bacile, Nick J.; and Blonigan, Wendell T., 4,919,542, Cl. 374-9.000.

Bada, Hajime: *See—*
Yamada, Sumio; Tada, Chikashi; Taoka, Keizo; and Bada, Hajime, 4,919,713, Cl. 75-532.000.

Badia, Marcelo S., to Institute Municipal D'Assistencia Sanitaria. Connection for catheters, perfusion units and flasks of liquid to be perfused. 4,919,658, Cl. 604-265.000.

Badley, William G.: *See—*
DeSousa, Daniel A.; Badley, William G.; and D'Innocente, Ralph, 4,918,768, Cl. 4-542.000.

Baffes, Paul T., to United States of America, National Aeronautics and Space Administration. Method of up-front load balancing for local memory parallel processors. 4,920,487, Cl. 364-300.000.

Bagchi, Pranab, to Eastman Kodak Company. Gelatin-grafted polymer particles. 4,920,004, Cl. 428-407.000.

Baghdady, Elie J. Method and apparatus for signal modulation and detection. 4,920,348, Cl. 342-433.000.

Bagley, Brian G.; Gmitter, Thomas J.; and Yablonovitch, Eli, to Bell Communications Research, Inc. Arsenic sulfide surface passivation of III-V semiconductors. 4,920,078, Cl. 437-243.000.

Baildon, David E. Flexible oral airways and methods. 4,919,126, Cl. 128-207.140.

Bailey, James L., to Bailey, James L. Riser or pop-up irrigation sprinkler. 4,919,332, Cl. 239-205.000.

Baird, Billy C.: *See—*
Baird, William R.; and Baird, Billy C., 4,919,764, Cl. 202-248.000.

Baird, Ronald J.: *See—*
McCune, Robert C.; and Baird, Ronald J., 4,919,974, Cl. 427-249.000.

Baird, William R.; and Baird, Billy C., to Saturn Machine & Welding Co., Inc. Retrofit coke oven door seal. 4,919,764, Cl. 202-248.000.

Bajzek, Thomas J.: *See—*
Bridges, Jack E.; Dubiel, George T.; and Bajzek, Thomas J., 4,919,201, Cl. 166-60.000.

Baker Hughes Incorporated: *See—*
Lasson, Alan R., 4,919,812, Cl. 210-519.000.

Baker, Richard W., to Pharmetrix Corporation. Periodontal disease treatment system. 4,919,939, Cl. 424-493.000.

Baker, Walter; and Council, Malcolm N., to Otis Engineering Corporation. Apparatus and methods for cleaning a well. 4,919,204, Cl. 166-223.000.

Balentine, Alfred, III. Bicycle brake light. 4,920,464, Cl. 362-72.000.

Ball, W. Kenneth; Goulait, David J. K.; and Zorb, James E., to Procter & Gamble Company, The. Dynamic mechanical bonding method and apparatus. 4,919,738, Cl. 156-73.500.

Baldbaugh, Richard K., to Moorman Manufacturing Company. System for concentrating animals in individual stalls. 4,919,080, Cl. 119-20.000.

Baltzer, Donald L.; Kindelberger, Jack D.; and Bartko, William, to Vail Industries, Inc. Container packaging. 4,919,263, Cl. 206-326.000.

Balzers Aktiengesellschaft: *See*—
Buhl, Rainer; and Peyer, Christof, 4,919,968, Cl. 427-37.000.

Bandurski, Eric L.; Vu, Phach F. N.; and Bruce, Gary D., to Amoco Corporation. Thermal extraction/pyrolysis gas chromatograph. 4,919,893, Cl. 422-78.000.

Banyai, Bruce E.; LaSota, Denis E.; and Struck, Dennis L., to Aqualon Company. Binder for metal-containing ores. 4,919,711, Cl. 75-321.000.

Barbee, Robert B., to Eastman Kodak Company. Powder coating compositions. 4,920,008, Cl. 428-458.000.

Barber, James C., to James C. Barber and Associates, Inc. Processes and equipment for production of elemental phosphorus and thermal phosphoric acid. 4,919,906, Cl. 423-323.000.

Barenburg, Alexander. Method of installing piping, ducts and conduits in a prefabricated framed wall for a building structure and partition made thereby. 4,919,164, Cl. 137-15.000.

Barlascini, Cornelius O.: *See*—
Nestler, John E.; Barlascini, Cornelius O.; Clore, John N.; and Blackard, William G., 4,920,115, Cl. 514-178.000.

Barletta, Gualtiero; and Bianchi, Antonio, to Colgate Palmolive Co. Process for manufacturing particulate detergent composition directly from in situ produced anionic detergent salt. 4,919,847, Cl. 252-558.000.

Barlow, David: *See*—
Nakamura, Ichiro; Shinkai, Naruto; Barlow, David; and Nakada, Akio, 4,920,413, Cl. 358-98.000.

Barnes, Karen W.: *See*—
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Barr, Robert; and Fletcher, Joel A., to Robert Barr. Internal pilferage alarm. 4,920,333, Cl. 340-545.000.

Barry, David L.; Dreher, Mark L.; Johnson, Alan A.; and Schroeder, Otto E., to Frito-Lay, Inc. High solids filling material and comestible product. 4,919,947, Cl. 426-94.000.

Barsony Istvan: *See*—
Barsony, Istyan, 4,920,400, Cl. 357-58.000.

Barsony, Istyan, to Research Development Corporation of Japan; and Barsony Istvan. Semiconductor device. 4,920,400, Cl. 357-58.000.

Barth, Walter; Braunbach, Karl-Heinz; and Stabler, Manfred, to Robert Bosch GmbH. Eccentric grinder. 4,918,868, Cl. 51-120.000.

Bartholomew, Donald D., to Proprietary Technology, Inc. Serpentine strip spring. 4,919,403, Cl. 267-165.000.

Bartis, Peter A. Portable storage tank. 4,919,289, Cl. 220-1.00B.

Bartko, William: *See*—
Baltzer, Donald L.; Kindelberger, Jack D.; and Bartko, William, 4,919,263, Cl. 206-326.000.

Bartlett, Homer E.; and Gallagher, Kevin P., to Computer Science Inovations, Inc. Diplexer for orthogonally polarized transmit/receive signalling on common frequency. 4,920,351, Cl. 343-756.000.

Barton, Robert A.: *See*—
Smith, James W.; Barton, Robert A.; and Knight, Cyril H., deceased, 4,919,914, Cl. 423-576.200.

Bartosiak, George; Siskovic, Christopher; Tap, Henry H.; Paris, Sam; and Goldberg, Arthur E., to Square D Company. Infrared thermometer with fiber optic remote pickup. 4,919,505, Cl. 350-96.180.

Bartz, Wilfried, to Huels Aktiengesellschaft. Impact-resistant polyester molding compounds. 4,920,174, Cl. 525-66.000.

Bascom, Betty A.: *See*—
Bascom, Charles A.; and Bascom, Betty A., 4,918,853, Cl. 43-26.000.

Bascom, Charles A.; and Bascom, Betty A. Portable, collapsible ice fishing device. 4,918,853, Cl. 43-26.000.

BASF Aktiengesellschaft: *See*—
Burstinghaus, Rainer; and Hofmeister, Peter, 4,920,108, Cl. 514-134.000.
Dyksterhouse, Robert; Dyksterhouse, Joel A.; Handermann, Alan C.; and Western, Edward D., 4,919,739, Cl. 156-181.000.
Goetz, Norbert; Karbach, Stefan; and Recker, Hans-Gert, 4,920,232, Cl. 546-338.000.
Neubauer, Hans-Jurgen; Seppelt, Wolfgang; Burstinghaus, Rainer; Hofmeister, Peter; and Kuenasi, Christoph, 4,920,110, Cl. 514-438.000.
Schulz, Guenther; Druschke, Wolfgang; and Jaeger, Helmut, 4,920,157, Cl. 522-96.000.
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BASF Corporation: *See*—
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Bass, Donald R. Method and apparatus for refurbishing golf clubs. 4,918,873, Cl. 51-281.00R.

Basseches, Mark T.: *See*—
Kemp, Dennis E., Jr., 4,919,011, Cl. 475-183.000.

Bateman, Robert; and Christensen, Donald R. User selection of meter ballistics. 4,920,311, Cl. 324-125.000.

Bates, H. John; Achterman, Kermit L.; Gearin, Peter; and Halpin, Terence, to Greesbrier Intermodal, Inc. Method and apparatus for loading automobiles into a cargo container. 4,919,582, Cl. 414-233.000.

Bateson, George F.; Morris, Charles A.; and Heuer, Glenn C., to Ogilvie Mills, Inc. Methods for drying honey and molasses. 4,919,956, Cl. 426-465.000.

Battelle Memorial Institute: *See*—
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Baty, Kurt F., to Stratus Computer, Inc. Fault-tolerant digital timing apparatus and method. 4,920,540, Cl. 371-61.000.

Baumgartner, Reinhold; Lenz, Hans; Stepp, Herbert; and Unsold, Eberhard, to Gesellschaft fur Strahlenund Umweltforschung mbH. Apparatus for generating various laser wavelengths from the same laser medium. 4,920,541, Cl. 372-23.000.

Baumith, Robert C.; Cote, William J.; Cronin, John E.; Holland, Karey L.; Kaanta, Carter W.; Lee, Pei-Ing P.; and Wright, Terrance M., to International Business Machines Corporation. Etching metal films with complexing chloride plasma. 4,919,750, Cl. 156-643.000.

Baxter International Inc.: *See*—
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Baybrook, Howard E.: *See*—
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Bayer Aktiengesellschaft: *See*—
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Buysch, Hans-Josef; Schon, Norbert; Kress, Hans-Jurgen; Eichenauer, Herbert; and Buekers, Josef, 4,920,166, Cl. 524-141.000.
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Schmidt, Adolf; Hendricks, Udo; Bomer, Bruno; Ott, Karl-Heinz; Eichenauer, Herbert; and Pischtschan, Alfred, 4,920,181, Cl. 525-327.500.
Wehling, Bernhard; Makowka, Bernd; Klein, Heinz-Guster, deceased; Klein, Gertrud, heir; and Rosentreter, Helga, 4,919,680, Cl. 8-94.270.
Wilhelm, Volker; and Mansmann, Manfred, 4,919,723, Cl. 106-441.000.
Zabrocki, Karl; Lindner, Christian; Koch, Otto; and Braese, Hans-Eberhard, 4,920,178, Cl. 525-262.000.

Bayerische Motoren Werke Aktiengesellschaft: *See*—
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BBC Brown Boveri AG: *See*—
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Beachey, Edwin H.; and Dale, James B., to University of Tennessee Research Corporation. Synthetic M proteins-streptococci type 5. 4,919,930, Cl. 424-88.000.

Beall, George H.; and Quinn, Candace J., to Corning Incorporated. R_2O-Al_2O_3/B_2O_3-P_2O_5 glasses. 4,920,081, Cl. 501-47.000.

Beaman, Donald R.: *See*—
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Beard, Walter C.; and Yallop, Michael D., to Bespak PLC. Collapsible chamber metering valves. 4,919,312, Cl. 222-402.200.

Beaulieu, Bryan, to Skyline Displays, Inc. Portable display case. 4,919,259, Cl. 206-45.200.

Beck, Lee R., to Stolle Research & Development Corporation. Mammal immunization. 4,919,929, Cl. 424-88.000.

Beck, Niels J.: *See*—
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Beckeman, Raymond A.: *See*—
Lusenschloss, John T.; Ebbott, Henry M.; Beckeman, Raymond A.; and Gregerson, Glen M., 4,918,864, Cl. 49-137.000.

Becker, Christopher H., to SRI International. Method for preparing samples for mass analysis by desorption from a frozen solution. 4,920,264, Cl. 250-282.000.

Becker, Frederick E.: *See*—
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Becker, Reinhard: *See*—
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Beckman Instruments Inc.: *See*—
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Becton, Dickinson and Company: *See*—
McFarland, Edward; Uithoven, Keith; and Carlson, Jeffrey, 4,920,046, Cl. 435-7.000.
Streeter, James M., 4,919,134, Cl. 128-400.000.

Bedoukian, Paul Z. Method for extracting cedar wood oil. 4,920,096, Cl. 512-5.000.

Bee Chemical Company: *See*—
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Beecham Group p.l.c.: *See*—
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Behr, Friedrich, to Thyssen Edelstahlwerke AG. Filter for small particles. 4,919,863, Cl. 264-42.000.

Behr Industrieanlagen GmbH & Co.: *See*—
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Behringer, Hartmut; and Rehberg, Heinrich, to Hoechst Aktiengesellschaft. Process for making azo pigments. 4,920,206, Cl. 534-582.000.

Behringer, Hartmut: *See*—
Rehberg, Heinrich; and Behringer, Hartmut, 4,920,205, Cl. 534-582.000.

Beier, Helmut; Bohrdt, Joaquin-Conrado; and Schuler, Klaus, to Siemens Aktiengesellschaft. Electric high-voltage circuit breaker. 4,920,242, Cl. 200-148.00B.

Bell Canada: *See*—
Trumble, William P.; Ross, Alan D.; and Dick, Kevin H., 4,918,885, Cl. 52-125.300.

Bell Communications Research, Inc.: *See*—
Bagley, Brian G.; Gmitter, Thomas J.; and Yablonovitch, Eli, 4,920,078, Cl. 437-243.000.
Colas, Etienne G.; and Yi-Yan, Alfredo, 4,919,504, Cl. 350-96.120.

Bell & Howell Publication Systems Company: *See*—
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Bell, Malcolm R.; and Ackerman, James H., to Sterling Drug Inc. Pyrazolo[3,4-b]quinolines and their use as antiviral agents. 4,920,128, Cl. 514-293.000.

Bellazzi, Emilio, to Arcelli & Bernacchi Srl. Metal clamp for joining pipes. 4,919,682, Cl. 24-20.00R.

Belleville, Ernest L., to Davidson Textron Inc. Locking assembly. 4,919,559, Cl. 403-13.000.

Beloit Corporation: *See*—
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Bender, Richard; and Scheiderer, Gerrit, to Dynamit Nobel Aktiengesellschaft. Gas generator for air bag. 4,919,897, Cl. 422-165.000.

Bender, Steven A.: *See*—
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Benedetti, Louis. Method and apparatus for forming stringers for free-standing circular staircases. 4,918,799, Cl. 29-467.000.

Benjamin, Olivier; Franklin, Robert P.; and Larocca, John, to Trans World Marketing Corp. Rotating display. 4,919,383, Cl. 248-349.000.

Benoit, Fredrick C.; Cardenas, Ruben; Schmid, Daniel; and Wisniewski, Joseph M., to Harpers. Raceway system for modular wall panels. 4,918,886, Cl. 52-221.000.

Benoit, Jacques: *See*—
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Benson, Richard E.; Gavrilos, Andrew D.; Rand, Robert S.; Shaw, Scott M.; Spafford, Joel W.; and Walko, Ronald J., to Babcock & Wilcox Company, The. Auto calibrating electro hydraulic servo driver. 4,920,305, Cl. 318-657.000.

Benting, Gary M., to Smith Investment Company. Shampoo chair and bowl apparatus. 4,918,767, Cl. 4-517.000.

Bergersen, Earl O. Dental-form expansion appliance. 4,919,612, Cl. 433-6.000.

Bergfelder, Jurgen, to Strabag Bau-AG. Fender pile. 4,919,572, Cl. 405-212.000.

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Berschauer, Friedrich: *See*—
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Bespak PLC: *See*—
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Best Lock Corporation: *See*—
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Beuke, Karl, to Wagner, Paul-Heinz. Hydraulic power wrench. 4,919,018, Cl. 81-57.390.

Beyer, Karl H., Jr. Method for controlling and/or lowering serum triglyceride and/or cholesterol levels in mammals. 4,920,123, Cl. 514-255.000.

Bianchi, Antonio: *See*—
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Biddle, Richard A.; and Willer, Rodney L., to Morton Thiokol Inc. Thermoplastic elastomer-based low vulnerability ammunition gun propellants. 4,919,737, Cl. 149-19.500.

Bieri Pumpenbau AG: *See*—
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Biermann, Manfred: *See*—
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Billman, Timothy B.; and Goodman, Joseph R., to AMP Incorporated. Burn-in socket for integrated circuit device. 4,919,623, Cl. 439-70.000.

Bilou, Inc.: *See*—
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Bimanand, Alex Z.: *See*—
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Bingham, Lynn R.; and Henke, Jerome R., to Pizza Hut, Inc. Compact pizza preparation and delivery vehicle. 4,919,477, Cl. 296-24.100.

Binkley, Joseph H.; Caro, Perry A.; Dillon, John B.; Fay, Charles R.; Gibbons, Jonathan; Hooks, Hilary N.; Kadifa, Abdo G.; Lee, Jeffery W.; Lynch, William C.; Mock, Clayton W.; Neely, Everett T.; Tallan, Michael L.; Thompson, Geoffrey O.; Vukkadala, Gaya; Wick, John D.; and Woods, Donald R., to Xerox Corporation. Emulation with display update trapping. 4,920,481, Cl. 364-200.000.

Binns, Lloyd S., to Hi-Shear Corporation. Blind fastener. 4,919,577, Cl. 411-43.000.

Biocarb AB: *See*—
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BioControl Systems, Inc.: *See*—
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Bionica Pty. Limited: *See*—
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BioSurge, Inc.: *See*—
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Biotechnology Research Partners, Ltd.: *See*—
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Biotronik, Mess- und Therapiegerate GmbH & Co. Ingenieurburo Berlin: *See*—
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Bisso, Guglielmo M.; and Melelli, Federico. Process for the continuous production of fructose-1,6-di-phosphate by employ of immobilized yeast. 4,920,049, Cl. 435-105.000.

Bizjak, John: *See*—
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Black Clawson Company, The: *See*—
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Blackard, William G.: *See*—
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Bladon, John J., to Shipley Company Inc. Electroplating process. 4,919,768, Cl. 204-15.000.

Blair, Dennis P.: *See*—
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Blanchard, Richard A.; and Cogan, Adrian I., to Siliconix Incorporated. Power transistor with integrated gate resistor. 4,920,388, Cl. 357-23.400.

Blem, Allen R.; Plant, Howard L.; and Regis, Richard R., to Uniroyal Chemical Company, Inc. Method of stimulating the growth of plants employing substituted oxadiazoles. 4,919,703, Cl. 71-86.000.

Blet, Louis J. C.: *See*—
Guillaumon, Jean-Claude; and Blet, Louis J. C., 4,920,163, Cl. 523-440.000.

Bleuel, Eric P.; Ingwersen, Peter; Lickus, Leonard J.; Pellegrino, Thomas P.; Shah, Hasmukh; and Suthard, Robert A., to Molex Incorporated. Modular application tooling for electrical connectors. 4,918,804, Cl. 29-33.00M.

Blight, Ronald E.: *See*—
Schloemann, Ernst F. R. A.; Blight, Ronald E.; and Mozzi, Robert L., 4,920,323, Cl. 333-1.100.

Blohm & Voss AG: *See*—
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Bloink, Harry W. Quick-change tool adapter. 4,919,023, Cl. 82-160.000.

Blom, Niels J., to Haldor Topsoe A/S. Crystalline aluminosilicate and a method for its preparation. 4,919,908, Cl. 423-328.000.

Blonigan, Wendell T.: *See*—
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Bloyce, Lionel T.: *See*—
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Blue Giant Equipment Corporation: *See*—
Larsen, Kurt K.; and Santiago, Pete, 4,919,233, Cl. 187-9.00R.

Blum, Ronald D.; Reid, Scott; and Silverman, Howard P. Method for curing plastic lenses. 4,919,850, Cl. 264-1.400.

Blundell, David J.; Cogswell, Frederic N.; and Meakin, Peter J., to Imperial Chemical Industries PLC. Process for making microporous products and the products thereof. 4,919,992, Cl. 428-131.000.

Board of Regents, The University of Texas System: *See*—
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Boardman Molded Products, Inc.: *See*—
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BOC Group, Inc., The: *See*—
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BOC Group PLC.: *See*—
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Bock, Wojtek J.; and Domanski, Andrzej W., to Universite Du Quebec A Hull. Birefringent optical fiber device for measuring of ambient pressure in a stabilized temperature environment. 4,920,261, Cl. 250-225.000.

Bode, Harald, to F. Willich Berg-und Bautechnik GmbH & Co. Organomineral foamed materials and processes for their preparation. 4,920,155, Cl. 521-154.000.

Bodin, Andre : *See*—
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Bodurow, Constance C.; Murphy, Larry D.; and Perry, Gordon R., to Commercial and Architectural Products, Inc. Merchandising wall structure including readily attachable and detachable panels and having plastic reveals. 4,918,879, Cl. 52-36.000.

Boeing Company, The: *See*—
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Bohner, Beat; and Meyer, Willy, to Ciba-Geigy Corporation. Aminopyrazinones and aminotriazinones. 4,920,223, Cl. 544-182.000.

Bohrdt, Joaquin-Conrado: *See*—
Beier, Helmut; Bohrdt, Joaquin-Conrado; and Schuler, Klaus, 4,920,242, Cl. 200-148.00B.

Bollinger, Edward R.: *See*—
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Bolz, Ralph C., to Ford Motor Company. Pilot operated solenoid valve in an automatic transmission control circuit. 4,919,012, Cl. 74-866.000.

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Bonauto, David K.: *See*—
Brunelle, Daniel J.; and Bonauto, David K., 4,920,200, Cl. 528-370.000.

Bondioli, Edi. Oil-bath mechanical drive box with input and output shafts and with automatic and/or driven devices housed therein and inserted in the drive. 4,919,244, Cl. 192-56.00R.

Bonfert, Helmut; Hardt, Thomas; Klumpp, Rolf; and Wagner, Wolf-Dietrich, to Daimler-Benz AG. Sealing passage arrangement for a pipeline. 4,919,371, Cl. 248-56.000.

Bonhomme, Henri, to Acec Transport S.A. Semiconductor-assisted ultra-fast contact breaker. 4,920,448, Cl. 361-102.000.

Bonin, Werner; Demoute, Jean-Pierre; and Tessier, Jean, to Roussel Uclaf. Process of braking trifluoromethyl compounds. 4,920,231, Cl. 546-300.000.

Bonnet, Guy M.: *See*—
Martin, Gerard M.; Claramonte, Manuel P.; Auffret, Jean-Claude; Bonnet, Guy M.; and Delarue, Jean-Jacques, 4,919,900, Cl. 422-245.000.

Bonora, Anthony C.: *See*—
Torbert, Walter; Struven, Kenneth C.; Lorenzini, Robert E.; and Bonora, Anthony C., 4,918,870, Cl. 51-131.300.

Bordignon, Abramo. Guide element structure engageable in sliding contact with a magnetic support. 4,920,439, Cl. 360-130.210.

Borgens, Richard B.; and McGinnis, Michael E., to Purdue Research Foundation. Method and apparatus for regenerating nerves. 4,919,140, Cl. 128-422.000.

Born, Gerald W., to Quality Products, Inc. Pressure vessel for sprayers. 4,919,311, Cl. 222-401.000.

Boston, Ernest B., to Phillips Petroleum Company. Unclouded metals passivation additive. 4,919,840, Cl. 252-182.300.

Bottrich, Johannes G.: *See*—
Feller, Wolfgang; Macht, Norbert; and Bottrich, Johannes G., 4,920,194, Cl. 530-385.000.

Bouchard, Roland D. Trash bin vehicle transporter. 4,919,584, Cl. 414-540.000.

Boucher, Heather A.: *See*—
Hamner, Glen P., deceased; Sawyer, Willard H.; and Boucher, Heather A., 4,919,786, Cl. 208-27.000.

Boudreault, Ghislain, to Alcan International Limited. Method for feeding particulate material. 4,919,303, Cl. 222-1.000.

Bougher, Jerry D.; Anthony, James R.; Williams, Jeffrey L.; Homeier, Ronald F.; and Lortz, Allan R., to Indiana Mills & Manufacturing, Inc. Anti-cinch seat belt system. 4,919,484, Cl. 297-474.000.

Boulanger, Alain, to Geostock S.A.R.L. and ESYS S.A. Method of confining wastes underground in a cavity leached out of salt. 4,919,822, Cl. 210-747.000.

Boulanger, Denis: *See*—
Whittaker, Neil; and Boulanger, Denis, 4,920,324, Cl. 333-106.000.

Bourrel, Maurice: *See*—
Conrad, Neal; Burchill, Michael T.; Silbermann, Joseph; Hoffman, Thomas; and Bourrel, Maurice, 4,919,972, Cl. 427-160.000.

Bowen, Terry P.; Deeg, Emil W.; Helm, James G.; and Stauffer, Larry R., to AMP Incorporated. Construction of an optical fiber with a connector. 4,920,366, Cl. 350-96.200.

Bowen, Thomas C.: *See*—
Newman, Neil A.; and Bowen, Thomas C., 4,919,009, Cl. 475-44.000.

Bowley, Heather J.; Gerrard, Donald L.; and Preedy, John E., to British Petroleum Company plc, The. Method for detecting diamonds in remote locations. 4,919,533, Cl. 356-30.000.

Boy, Charles E.: *See*—
Heaps, Harry D., Jr.; and Boy, Charles E., 4,919,306, Cl. 222-105.000.

Boyle, William J., Jr.: *See*—
Tang, Reginald T.; Mares, Frank; Boyle, William J., Jr.; Chiu, Tin-Ho; and Patel, Kundabhai M., 4,920,203, Cl. 525-409.000.

BPB Industries Public Limited Company: *See*—
Watkins, David W., 4,919,613, Cl. 432-58.000.

BPMF, Inc.: *See*—
Jones, Evan W., 4,919,975, Cl. 427-260.000.

Bracci, Thomas W.: *See*—
Grossi, Benedetto; and Bracci, Thomas W., 4,919,131, Cl. 606-46.000.

Bracker, Jeffrey; Kirk, Karl D., III; and Spranger, Douglas M., to BioSurge, Inc. Safety device for hypodermic syringe to prevent stick injuries. 4,919,656, Cl. 604-192.000.

Braden, Francis A. Heat economizer. 4,919,245, Cl. 165-10.000.

Braese, Hans-Eberhard: *See*—
Zabrocki, Karl; Lindner, Christian; Koch, Otto; and Braese, Hans-Eberhard, 4,920,178, Cl. 525-262.000.

Bramball, George H.: *See*—
Sovis, John F.; Smith, Robert M.; and Bramball, George H., 4,918,781, Cl. 15-392.000.

Brandeis University: *See*—
Perlman, Daniel, 4,920,269, Cl. 250-364.000.

Brandl, Michael: *See*—
Breslow, Ronald; Brandl, Michael; Adams, Alan D.; and Hunger, Jurgen, 4,920,216, Cl. 540-110.000.

Brandlein, Lawrence S.: *See*—
Arora, Vijay K.; Jones, Gary V.; Kovtun, John M.; and Brandlein, Lawrence S., 4,919,962, Cl. 426-594.000.

Brandon, Bobby C., to Teknamed Corporation. Sanitary shoe cover. 4,918,839, Cl. 36-7.10R.

Brault, Alfred; and Rosa-Miranda, Roberto, to Davidson Textron Inc. Logo spray apparatus. 4,919,069, Cl. 118-308.000.

Braunbach, Karl-Heinz: *See*—
Barth, Walter; Braunbach, Karl-Heinz; and Stabler, Manfred, 4,918,868, Cl. 51-120.000.

Brazelton, Carl L.; Litherland, Troy C.; and Johnston, James G., to Stranco, Inc. Dual-pump mixing and feeding apparatus. 4,920,519, Cl. 366-161.000.

Breadner, Dennis. Tree branch spreader. 4,918,860, Cl. 47-42.000.

Brearley, Malcolm; and Moseley, Richard B., to Lucas Industries public limited company. Transducer control in vehicle braking systems. 4,920,493, Cl. 364-426.010.

Bredbenner, Craig N.; Giniecki, Troy A.; Selamoglu, Nur; and Stocker, Hans J., to AT&T Bell Laboratories. Method for tapered etching. 4,919,748, Cl. 156-643.000.

Breitenbach, Otto: *See*—
Wcislo, Manfred; Raschbichler, Hans G.; Miller, Luitpold; and Breitenbach, Otto, 4,918,835, Cl. 29-732.000.

Breslow, Ronald; Brandl, Michael; Adams, Alan D.; and Hunger, Jurgen, to Columbia in the City of New York, The Trustees of. Selective chlorination of steroids and other substrates directed by covalently linked pyridine derivatives acting as templates. 4,920,216, Cl. 540-110.000.

Bretan, Peter D., Jr., to Cleveland Clinic Foundation, The. Intracellular flush solution for preserving organs. 4,920,044, Cl. 435-1.000.

Brewer, Arthur D., to Uniroyal Chemical Ltd/Uniroyal Chemical Ltee. Barbituric acid derivative and treatment of leukemia and tumors therewith. 4,920,126, Cl. 514-274.000.

Brewer, Earl G.: *See*—
Lee, Robert W.; and Brewer, Earl G., 4,920,009, Cl. 428-552.000.

Bricker, Maureen L.; and Lawson, R. Joe, to Allied-Signal Inc. Catalyst for treatment of exhaust gases from internal combustion engines. 4,919,902, Cl. 423-213.500.

Bricmont & Associates, Inc.: *See*—
Bricmont, Francis H., 4,919,254, Cl. 198-751.000.

Bricmont, Francis H., to Bricmont & Associates, Inc. Walking beam apparatus and method. 4,919,254, Cl. 198-751.000.

Bridges, Jack E.; Dubiel, George T.; and Bajzek, Thomas J., to Uentech Corporation. Corrosion inhibition apparatus for downhole electrical heating. 4,919,201, Cl. 166-60.000.

Bridgestone Corporation: *See*—
Saito, Tasuku, 4,919,434, Cl. 273-235.00R.
Tabata, Toshiyuki; and Ishiyama, Tatsuro, 4,919,400, Cl. 267-140.100.

Brier, Geoffrey; and Rayne, Mark W., to U.S. Philips Corporation. Data port selection. 4,920,511, Cl. 364-900.000.

Brier Technology, Inc.: *See*—
Kenny, Philip; Cautis, Dan; and Bizjak, John, 4,918,972, Cl. 73-1.00R.

Briere, Richard L., decessed: *See*—
Fotland, Richard A.; Grosclaude, Gary V.; and Briere, Richard L., decessed, 4,920,039, Cl. 430-324.000.

Briggs, Michael, to Helmet Limited, Moat Factory. Helmet with detachable front section. 4,918,752, Cl. 2-6.000.

Brigham, Leslie E., Jr.: *See*—
Brigham, Leslie E., Sr.; and Brigham, Leslie E., Jr., 4,919,257, Cl. 202-158.000.

Brigham, Leslie E., Sr.; and Brigham, Leslie E., Jr. Condensate skimming reflux column. 4,919,257, Cl. 202-158.000.

Brigham and Women's Hospital: *See*—
Popitz, Michael D., 4,918,774, Cl. 5-441.000.

Briner, Emil; and Wehrli, Samuel, to Maschinenfabrik Rieter AG. Method of, and device for, performing a start spinning operation for spinning of a yarn in a friction spinning apparatus. 4,918,913, Cl. 57-263.000.

Briner, Paul H.: *See*—
Curtze, Jurgen; Schroder, Ludwig; and Briner, Paul H., 4,920,222, Cl. 544-158.000.

Britax (GECO) S.A.: *See*—
Duroux, Bernard, 4,918,920, Cl. 60-536.000.

Britax Rainsfords Pty. Ltd.: *See*—
Gilbert, Robert, 4,919,525, Cl. 350-604.000.

British Nuclear Fuels plc: *See*—
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British Petroleum Company plc, The: *See*—
Bowley, Heather J.; Gerrard, Donald L.; and Preedy, John E., 4,919,533, Cl. 356-30.000.

British Telecommunications public company limited: *See*—
Allkins, Martin D., 4,920,564, Cl. 379-437.000.

Brodard, Roland, to Medicomex S.A. Electrical neuromuscular stimulation device. 4,919,139, Cl. 128-421.000.

Brodersen, Craig, to Jeneric/Pentron Incorporated. Molten-metal forming method and apparatus which are bottom-loading, bottom-pouring and bottom-unloading. 4,919,191, Cl. 164-495.000.

Brodsky, Bruce L.; Davidson, David L.; Hutton, Dwight L.; Vasiladiotis, William L.; and White, Mark D., to Westinghouse Electric Corp. Electronic control for lighting panelboards. 4,920,476, Cl. 364-140.000.

Brois, Stanley J.: *See*—
Thaler, Warren A.; Brois, Stanley J.; and Hall, Henry K., 4,920,179, Cl. 525-285.000.

Bromine Compounds Limited: *See*—
Segall, Jeane; and Shorr, Leonard M., 4,920,137, Cl. 514-372.000.

Bronzavia Aeronautique: *See*—
Joly, Claude, 4,919,995, Cl. 428-189.000.

Brosson, Philippe; Jacquet, Joel; Artigue, Claude; Leclerc, Denis; and Benoit, Jacques, to Alcatel N.V. Tunable semiconductor laser. 4,920,542, Cl. 372-50.000.

Brotcke, John J., to Canaceramic Limited. Water closet with supplemented rim wash water flow. 4,918,763, Cl. 4-331.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Akao, Michitoshi; Sakakibara, Kenji; Katoh, Tokunori; Sawaki, Yukichi; Sonoda, Takakuni; and Suzuki, Makoto, 4,920,375, Cl. 355-27.000.
Sangyoji, Kazuo; Yamamoto, Takemi; Okamoto, Tsugio; Hatta, Naoyuki; Asano, Yuji; Sakakibara, Kenji; Nakai, Hitoshi; Akao, Michitoshi; Sakai, Jun; and Matsumoto, Yumio, 4,920,374, Cl. 355-27.000.
Ueno, Hideo; Shibata, Satoshi; and Yamada, Keiko, 4,919,553, Cl. 400-120.000.
Yamamoto, Takemi; Sakai, Jun; and Sonoda, Takakuni, 4,920,376, Cl. 355-38.000.
Yokoe, Masaaki; Takagi, Tomoe; Matsushita, Narihiro; and Takagi, Yuzo, 4,919,062, Cl. 112-121.120.

Brown, David A.; Daniels, Donald V.; and Harrison, Joel N., to Quantum Corporation. Fixed disk drive. 4,920,434, Cl. 360-77.080.

Brown, Duncan W.: *See*—
Valentine, Donald, Jr.; and Brown, Duncan W., 4,920,068, Cl. 437-81.000.

Brown, Sam J. Centerline sight. 4,919,214, Cl. 172-430.000.

Brown, Wilmott G., to Westinghouse Electric Corp. Retrofitted rotor blades for steam turbines and method of making the same. 4,919,593, Cl. 416-223.00A.

Browning: *See*—
Larson, Marlow W., 4,919,108, Cl. 124-88.000.

Broze, Guy: *See*—
Durbut, Patrick; Mehreteab, Ammanuel; Mondin, Myriam; and Broze, Guy, 4,919,839, Cl. 252-153.000.

Bruce, Gary D.: *See*—
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Bruckner Trochentechnik GmbH & Co. KG: *See*—
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Bruhin, Rolf: *See*—
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Brun, Charles J., to Kindex, Inc. Sweep stacker. 4,919,588, Cl. 414-798.400.

Brunelle, Daniel J.; and Bonauto, David K., to General Electric Company. Hydroquinone-bisphenol cyclic copolycarbonate oligomer. 4,920,200, Cl. 528-370.000.

Bruning, Gert W.; and Stupp, Edward H., to North American Philips Corporation. High frequency high voltage power supply with controlled output power. 4,920,474, Cl. 363-97.000.

Brunner, Charlotte A.: *See*—
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Brunswick Corporation: *See*—
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Bryan, Mark: *See*—
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Bryan, William J., to Combustion Engineering, Inc. Lower end fitting debris collector and end cap spacer grid. 4,919,883, Cl. 376-352.000.

BTS Broadcast Television Systems GmbH: *See*—
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Bubley, Henry J.; and Motev, Phil, to American Screen Printing Company. Web tech drive assembly for stencil carriage. 4,919,043, Cl. 101-123.000.

Bucher, George D.; DiGrande, John T.; Frye, Lester C.; and Stoutamire, Mark S., to Westinghouse Electric Corp. Method for sampling nuclear fuel pellets with a robot gripper mechanism. 4,918,991, Cl. 73-864.000.

Buchhorn, Ursula; and Willert, Hans B., to Sulzer Brothers Limited. Implant having recesses for therapeutically effective substances. 4,919,666, Cl. 623-16.000.

Bucking, Hans-Walter: *See*—
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Buckley, Christopher M., to Scientific Glass (Drainline) Limited. Air conditioning apparatus. 4,918,940, Cl. 62-285.000.

Buckley, Paul. Multi-unit dispensing container assembly. 4,919,293, Cl. 220-23.200.

Buckman Laboratories International, Inc.: *See*—
Pera, John D.; and Rayudu, S. Rao, 4,920,107, Cl. 514-244.000.

Budde, Klaus; Nuyken, Oskar; and Melchior, Walter, to Siemens Aktiengesellschaft. Printed circuit manufacture employing a radiation cross-linkable photo-polymer system. 4,920,038, Cl. 430-315.000.

Budin, Didier. Harp made from composite material. 4,919,024, Cl. 84-265.000.

Buekers, Josef: *See*—
Buysch, Hans-Josef; Schon, Norbert; Kress, Hans-Jurgen; Eichenauer, Herbert; and Buekers, Josef, 4,920,166, Cl. 524-141.000.

Buhl, Rainer; and Peyer, Christof, to Balzers Aktiengesellschaft. Method and apparatus for vacuum vapor deposition. 4,919,968, Cl. 427-37.000.

Buhler, Roland; Erdelitsch, Herbert; Hecht, Walter; and Rachner, Horst, to SWF Auto-Electric GmbH. Electric switch, especially steering column switch for motor vehicles. 4,920,239, Cl. 200-61.540.

Buist, Ronald W. Cup holder. 4,919,381, Cl. 248-154.000.

Bulger, William J.: *See*—
Das, Sajal; Prevorsek, Dusan C.; Rhee, Seong K.; and Bulger, William J., 4,920,159, Cl. 523-153.000.

Bull, Hendrix R. Electrostatic/mechanical emulsion treating method and apparatus. 4,919,777, Cl. 204-188.000.

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Bunnell, Dean E. Ski support and attachment means. 4,919,406, Cl. 269-43.000.

Bunts, Walter A., to Bunts, Walter A. Equalized force shooter for a bow and arrow. 4,919,107, Cl. 124-24.00R.

Burchill, Michael T.: *See*—
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Burgdorf, Jochen; and Weise, Lutz, to Alfred Teves GmbH. Process of monitoring and controlling an anti-locking automotive brake system for carrying out the said process. 4,919,496, Cl. 303-114.000.

Burger, Willibald: *See*—
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Burkhardt, Charles W.: *See*—
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Burkhead, Wayne Z.: *See*—
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Burkinshaw, Brain D.: *See*—
Dale, James L.; Burkinshaw, Brain D.; and Burkhead, Wayne Z., 4,919,670, Cl. 623-19.000.

Burlington, Geoffrey M.; and Watkins, Stephen C., to Ofrex Group Holdings PLC. Shredding machines. 4,919,345, Cl. 241-36.000.

Burns, Matt B. Foot spraying and cleaning device. 4,918,779, Cl. 15-104.920.

Burow, Wilfried; Schulten, Gerd-Hermann; and Kiemle, Peter, to Bayer Aktiengesellschaft. Oxidation resistant, heat resistant iron oxide black pigments, a process for their preparation and their use. 4,919,727, Cl. 106-456.000.

Burr, James D. Telescope motorized drive attachment. 4,919,523, Cl. 350-567.000.

Burroughs Wellcome Co.: *See*—
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Buselli, Oscar L. Wall mounted decorative art convertible to a toss game with catch area. 4,919,436, Cl. 273-346.000.
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Bussiere, Guy; and Lablee, Jean, to Roquette Feres. Process for manufacturing soft cheeses. 4,919,944, Cl. 426-39.000.
Buysch, Hans-Josef; Schon, Norbert; Kress, Hans-Jurgen; Eichenauer, Herbert; and Buekers, Josef, to Bayer Aktiengesellschaft. Flame-resistant, antistatic polycarbonate molding compositions. 4,920,166, Cl. 524-141.000.
Byng, Graham S., to Miles Inc. Process for producing glucose isomerase. 4,920,052, Cl. 435-234.000.
C. CHRIST Abgasfreie Werkzeugreinigungsapparate fur die Kunststoffindustrie: *See*—
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Cady Systems, Inc.: *See*—
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Cady, William F., to Cady Systems, Inc. Spoked wheel fertilizer injector. 4,919,060, Cl. 111-128.000.
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Calkins, Dennis E., to McDermott International, Inc. Deepwater subsea lowering/lifting system. 4,919,393, Cl. 254-337.000.
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Huang, Fu-Chi; Galemmo, Robert A., Jr.; and Campbell, Henry F., 4,920,131, Cl. 514-311.000.
Huang, Fu-chi; Galemmo, Robert A., Jr.; and Campbell, Henry F., 4,920,132, Cl. 514-314.000.
Huang, Fu-chi; Galemmo, Robert A., Jr.; and Campbell, Henry F., 4,920,133, Cl. 514-314.000.
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Canadian Patents and Development Limited/Societe Canadienne Des Brevets Et D'Exploitation Limitee: *See*—
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Canon Kabushiki Kaisha: *See*—
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Itoh, Yuji, 4,920,275, Cl. 250-574.000.
Kaneda, Naoya; Wada, Hiroyuki; Hirasawa, Mashide; and Suda, Hirofumi, 4,920,369, Cl. 354-400.000.
Kimura, Tomohiro; and Kawamorita, Yoichi, 4,920,021, Cl. 430-56.000.
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Ogura, Makoto; Kawai, Tatsundo; Yamada, Katsuhiko; and Seito, Shinichi, 4,920,431, Cl. 358-496.000.
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Carnahan, Robert P.; and Murphy, Robert J., to Hydro Systems, Inc. System and method for treating wastewater collected from septic tanks and similar installation. 4,919,814, Cl. 210-603.000.
Carney, Wayne R. Deck seat and safety rail combination. 4,918,880, Cl. 52-8.000.
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Caron Compactor Co.: *See*—
Caron, James O.; Pratt, Kenneth H.; and Genger, Richard D., 4,919,566, Cl. 404-121.000.
Caron, James O.; Pratt, Kenneth H.; and Genger, Richard D., to Caron Compactor Co. Fill and compaction roller using readily replaceable cleat assemblies. 4,919,566, Cl. 404-121.000.
Carpenter, John C.: *See*—
Evans, Thomas L.; and Carpenter, John C., 4,920,183, Cl. 525-464.000.
Carpenter, Tim D.; and Hobbs, Claude C., to Hobbs Bonded Fibers. Plant growth bed with high loft textile fibers. 4,918,861, Cl. 47-59.000.
Cartry, Jean P.; and Fraissenet, Bruno, to Framatome. Device for remotely lining a steam generator tube of a pressurized water nuclear reactor. 4,918,808, Cl. 29-727.000.
Casellas, Pierre; Gros, Pierre; and Jansen, Franz, to Sanofi. Process for the potentiation of immunotoxins. 4,919,927, Cl. 424-85.910.
Casio Computer Co., Ltd.: *See*—
Matsumoto, Naoaki, 4,919,031, Cl. 84-601.000.
Sakashita, Shigeo, 4,919,032, Cl. 84-653.000.
Yamagishi, Kooji, 4,920,409, Cl. 358-56.000.
Cassidy, Ronald F.: *See*—
Stevenson, George F.; and Cassidy, Ronald F., 4,919,124, Cl. 128-202.260.
Cassina, Franco, to Cassina S.p.A. Foot for table leg. 4,919,386, Cl. 248-544.000.
Cassina S.p.A.: *See*—
Cassina, Franco, 4,919,386, Cl. 248-544.000.
Cast, Michael A.: *See*—
Weber, Jaroy, Jr.; Kloeckl, Terrance L.; Cast, Michael A.; and Watkins, Frank T., III, 4,919,129, Cl. 606-42.000.
Castaneda, Henry B., to Chemetrics, Inc. Method for colorimetric analysis of metals. 4,920,057, Cl. 436-77.000.
Castelaz, Patrick F., to Hughes Aircraft Company. Ultra-high speed two-dimensional coordinate transform processor. 4,920,506, Cl. 364-602.000.
Catalanotti, Paul; and Lotfi, Ali, to Roehr Tool Corporation. Molding apparatus with collapsible core. 4,919,608, Cl. 425-556.000.
Caterpillar Inc.: *See*—
Kiesewetter, Martin V.; and Renski, William J., 4,918,843, Cl. 37-142.00A.
Kyrtsos, Christos T.; and Worrell, Dean A., 4,919,222, Cl. 177-139.000.
Catheter Research, Inc.: *See*—
McCoy, William C.; Small, James E.; and Cole, Gregory, 4,918,919, Cl. 60-528.000.
Caulfield, J. Keith; Danner, B. Lee; and Milberger, Lionel J., to Vetco Gray Inc. Tieback connector with protective landing sleeve. 4,919,454, Cl. 285-18.000.
Cautis, Dan: *See*—
Kenny, Philip; Cautis, Dan; and Birjak, John, 4,918,972, Cl. 73-1.00R.
Caveney, Jack E.; and Kuzmuk, Jeffery S., to Panduit Corp. Push mount tie. 4,919,373, Cl. 248-74.300.
CBP Resources, Inc.: *See*—
Wellons, Fred H., 4,919,940, Cl. 426-2.000.

Ceelen, Theodorus M., to Xerox Corporation. Paper feeding device. 4,919,411, Cl. 271-35.000.

Ceiling Doctor International Inc.: *See*—
Forrest, Robin J.; and Ward, Russell C., 4,919,159, Cl. 134-22.180.

Celebration Medical Products, Inc.: *See*—
Weber, Jaroy, Jr.; Kloeckl, Terrance L.; Cast, Michael A.; and Watkins, Frank T., III, 4,919,129, Cl. 606-42.000.

Celia, Wayne M. Apparatus for bonding a low density material to a plastic substrate. 4,919,746, Cl. 156-359.000.

Cenisio, Marco F.; and Vareika, Vido J., to Hercules Incorporated. Stable aqueous emulsions of ketene dimer/nonreactive hydrophobe. 4,919,724, Cl. 106-199.000.

Centre International de Recherches Dermatologiques C.I.R.D.: *See*—
Shroot, Braham; Eustache, Jacques; and Bernardon, Jean-Michel, 4,920,140, Cl. 514-394.000.

Centre National d'Etudes des Telecommunications: *See*—
Le Gall, Jean C., 4,920,349, Cl. 343-709.000.

Centre Nationale d'Etudes Spatiales: *See*—
Guillaumon, Jean-Claude; and Blet, Louis J. C., 4,920,163, Cl. 523-440.000.

Cesare, Frank C.; Davis, Robert G.; and Sigworth, William D., to Uniroyal Chemical Company, Inc. Insulating adhesive tape composition and composites thereof. 4,919,976, Cl. 427-373.000.

Cetiner, M. Selim: *See*—
Roach, Kevin V.; Cetiner, M. Selim; Faherty, Vincent E.; and Ventura, Francis P., 4,918,907, Cl. 53-453.000.

CGEE Alsthom: *See*—
Pouillange, Jean, 4,918,997, Cl. 73-862.340.

Chabidon, Rene : *See*—
Masini, Jean-Jacques; and Chabidon, Rene , 4,919,458, Cl. 285-110.000.

Chambers Boyd McKinley and Associates: *See*—
Chambers, Joseph W., Sr., 4,919,346, Cl. 241-46.020.

Chambers, Joseph W., Sr., to Disposable Waste Systems, Inc.; and Chambers Boyd McKinley and Associates. Rotary screen diverter and solid waste handling system using same. 4,919,346, Cl. 241-46.020.

Champagne, Jean-Paul: *See*—
Dufresne, Michel; Sammoun, Samir; Gregory, Dave; Champagne, Jean-Paul; Tessier, Alain; Scott, Pierre; and Methot, Francois, 4,920,533, Cl. 370-85.200.

Champion Spark Plug Company: *See*—
Huang, Jow-Lay, 4,919,868, Cl. 264-65.000.

Champion Spark Plug Italiana S.P.A.: *See*—
Scorsiroli, Marcello, 4,918,780, Cl. 15-250.210.

Chan, Joni N.; and Moy, Andrew, to International Business Machines Corporation. Method of checking the execution of microcode sequences. 4,920,538, Cl. 371-19.000.

Chang, Chih-Li: *See*—
Shyu, Jia-Ming; and Chang, Chih-Li, 4,919,224, Cl. 180-168.000.

Chang, Clarence D.: *See*—
Absil, Robert P. L.; Chang, Clarence D.; Chu, Cynthia T-W.; and Klocke, Donald J., 4,919,790, Cl. 208-78.000.

Chang, David J. H., to Far East Athletics Ltd. Shoe sole having compressible shock absorbers. 4,918,838, Cl. 36-28.000.

Chang, Michael N.; Chiang, Yuan-Ching P.; Heck, James V.; Lewis, Michael D.; and Yang, Shu S., to Merck & Co., Inc. Acetylenic cyclic carbonates. 4,920,106, Cl. 514-63.000.

Chantelou, Olivier: *See*—
Remus, Christian; and Chantelou, Olivier, 4,920,414, Cl. 358-133.000.

Chaplin, Daniel J., to Grass Valley Group, Inc., The. Self keyer. 4,920,415, Cl. 358-183.000.

Charbonnages de France: *See*—
Flament, Gerard, 4,919,611, Cl. 431-350.000.

Charlet, Pascal; Lauverjat, Eric; and Moreno, Rafael, to SGS Thomson Microelectronics SA. Method to expand an analog signal and device to implement the method. 4,920,279, Cl. 307-264.000.

Chase, Lee M.; Goss, John; and Hegland, Philip M., to Measurex Corporation. System for determining the basis weight of cord reinforced tire fabric. 4,920,265, Cl. 250-308.000.

Chattopadhyay, Arun K., to Imperial Chemical Industries PLC. Water-in-oil emulsion explosive. 4,919,179, Cl. 149-2.000.

Chemetrics, Inc.: *See*—
Castaneda, Henry B., 4,920,057, Cl. 436-77.000.

Chen, Chengjun J., to International Business Machines Corporation. Self-induced repairing of conductor lines. 4,919,971, Cl. 427-98.000.

Chen, Feichu H.: *See*—
Chen, Haw-Renn; and Chen, Feichu H., 4,918,789, Cl. 24-67.900.

Chen, Haw-Renn; and Chen, Feichu H. Tripod clip. 4,918,789, Cl. 24-67.900.

Chen, Isabelita H.: *See*—
Chen, Joseph; and Chen, Isabelita H., 4,919,014, Cl. 81-3.200.

Chen, Joseph; and Chen, Isabelita H. Bottle closure opener. 4,919,014, Cl. 81-3.200.

Chen, Loren; van Buskirk, Gregory; Peterson, David; and Iliff, Robert J., to Clorox Company, The. Package for controlling the stability of a liquid nonaqueous detergent. 4,919,834, Cl. 252-90.000.

Chen, Nai Y.; Garwood, William E.; Huang, Tracy J.; Le, Quang N.; and Wong, Stephen S., to Mobil Oil Corporation. Lubricant production process. 4,919,788, Cl. 208-59.000.

Cherill, Robert J.: *See*—
Kosley, Raymond W., Jr.; Cherill, Robert J.; and O'Malley, Gerard, 4,920,146, Cl. 514-437.000.

Chester, Arthur W.; Chu, Pochen; Huss, Albin, Jr.; and Kirker, Garry W., to Mobil Oil Corporation. Metal passivating agents. 4,919,787, Cl. 208-52.0CT.

Chew, John: *See*—
Stratford, Brian S.; Hadaway, Edward S.; Chew, John; and Hartland, Howard G., 4,919,590, Cl. 415-116.000.

Chiang, Tien-Hon. Catheter apparatus employing shape memory alloy structures. 4,919,133, Cl. 606-159.000.

Chiang, Yuan-Ching P.: *See*—
Chang, Michael N.; Chiang, Yuan-Ching P.; Heck, James V.; Lewis, Michael D.; and Yang, Shu S., 4,920,106, Cl. 514-63.000.

Chicoine, Troy R., to Otis Elevator Company. Tamper resistant speaker grille for intercom module. 4,919,227, Cl. 181-175.000.

Chihara, Kenichi: *See*—
Kimura, Takashi; Chihara, Kenichi; Tomatsu, Masahiro; Inoue, Kazunobu; Yano, Norio; and Adachi, Osamu, 4,920,441, Cl. 360-133.000.

Childers, John, to Henkel Corporation. Fiber lubricants containing high molecular weight polyacrylamido alkane sulfonic acid additives. 4,919,828, Cl. 252-8.750.

Childers, Melvin D., Jr. Method of toasting slices of potato and other produce. 4,919,965, Cl. 426-615.000.

Chin, Albert K., to Origin Medsystems, Inc. Method and apparatus for removing pre-placed prosthetic joints and preparing for their replacement. 4,919,153, Cl. 606-93.000.

Chin, Daeje; and Dhong, Sang H., to International Business Machines Corporation. Method of making ultra dense dram cells. 4,920,065, Cl. 437-52.000.

Chin, Maw-Rong: *See*—
Chow, Yu C.; Liao, Kuan Y.; Chin, Maw-Rong; and Rhoades, Charles S., 4,920,403, Cl. 357-71.000.

Chinn, Joseph A.: *See*—
Horbett, Thomas A.; Ratner, Buddy D.; Chinn, Joseph A.; and Haque, Yasmeen, 4,919,659, Cl. 623-1.000.

Chinomi, Isamu; and Tanaka, Yuji, to Ikeda Bussan Co., Ltd. Vehicular seat. 4,919,486, Cl. 297-443.000.

Chiodini, Laura; Gobbini, Mauro; Mantegani, Sergio; Ruggieri, Daniela; Temperilli, Aldemio; Traquandi, Gabriella; and Ferrari, Patrizia, to Farmitalie Carlo Erba S.p.A. Aminoglycoside steroids, a process for their preparation, their use and pharmaceutical compositions containing them. 4,920,099, Cl. 514-26.000.

Chip, Gerald K.; and Rudin, Alfred, to Tioxide Group PLC. Polymeric particles and their preparation. 4,920,160, Cl. 523-201.000.

Chirhart, Dennis J.; Daniels, Michael P.; and Knepp, Kenneth G., to Minnesota Mining and Manufacturing Company. Method for making embossed information plate having retroreflective sheeting on the surface thereof. 4,919,741, Cl. 156-223.000.

Chiu, Tin-Ho: *See*—
Tang, Reginald T.; Mares, Frank; Boyle, William J., Jr.; Chiu, Tin-Ho; and Patel, Kundabhai M., 4,920,203, Cl. 525-409.000.

Cho, Hidetsura; and Ueda, Masaru, to Suntory Limited. N-substituted 3,4-dihydropyrimidine compounds as agents for treating disorders of cardiovascular system. 4,920,124, Cl. 514-256.000.

Cho, James R.; Smith, Terry E.; and Cottrell, Ian W., to GAF Chemical Corporation. Water-soluble complexes of water-insoluble pharmaceutical compounds and preparation thereof. 4,920,145, Cl. 514-420.000.

Cho, Soo-In; and Min, Dong-Sun, to Samsung Electronics Co., Ltd. Back bias generator. 4,920,280, Cl. 307-296.200.

Choi, Young-cha: *See*—
Park, Hae-chul; Choi, Young-cha; Park, Kyung-dong; Park, Mi-ae; and Park, Kyu-dong, 4,919,933, Cl. 424-196.100.

Chompff, Conrad, to A 'n D Cable Products, Inc. Local area network transceiver cable lock. 4,919,619, Cl. 439-371.000.

Chotard, Alain, to Framatome; and Cogema. Modular nuclear fuel element, modular capsule for such element and method for such element and method for manufacturing such modular capsule. 4,919,884, Cl. 376-419.000.

Chow, Jack K.: *See*—
Levy, Julia G.; Dolphin, David; Chow, Jack K.; and Sternberg, Ethan, 4,920,143, Cl. 514-410.000.

Chow, Mark K.: *See*—
Sheehan, Ronald T.; Seymour, Shaun A.; Chow, Mark K.; and Strosser, Richard P., 4,918,910, Cl. 56-341.000.

Chow, Yu C.; Liao, Kuan Y.; Chin, Maw-Rong; and Rhoades, Charles S., to Hughes Aircraft Company. Selective tungsten interconnection for yield enhancement. 4,920,403, Cl. 357-71.000.

Christensen, Donald R.: *See*—
Bateman, Robert; and Christensen, Donald R., 4,920,311, Cl. 324-125.000.

Christiaens, Alois E.; and Lebon, Leon G. G., to U.S. Philips Corporation. Synchronous or stepping motor with simplified tooth alignment. 4,920,294, Cl. 310-162.000.

Christiansen, David A.: *See*—
Gustafson, Alan D.; Naley, Lowell B.; Christiansen, David A.; Hoium, Stanley O.; Harrington, Robert L.; Johnson, Dannis R.; and Truckenbrod, Gregory R., 4,918,932, Cl. 62-89.000.

Chrysler Corporation: *See*—
Wroblewski, Thomas R., 4,920,532, Cl. 370-85.100.

Chrysler Motors Corporation: *See*—
Jeruzal, Thomas M., 4,919,277, Cl. 211-41.000.

Chu, Cynthia T-W.: *See*—
Absil, Robert P. L.; Chang, Clarence D.; Chu, Cynthia T-W.; and Klocke, Donald J., 4,919,790, Cl. 208-78.000.

Chu, Jack. Adjustable wheel structure. 4,918,783, Cl. 16-19.000.

Chu, Pochen: *See*—
Chester, Arthur W.; Chu, Pochen; Huss, Albin, Jr.; and Kirker, Garry W., 4,919,787, Cl. 208-52.0CT.

Chubu Industries, Inc.: *See*—
Himi, Kohei, 4,919,075, Cl. 118-699.000.

Chudy, John S.; Kniffin, M. John; and McNeil, D. Yvonne, to Ford Aerospace Corporation. Multi-detector dewar. 4,918,929, Cl. 62-51.100.

Chuo Hatsujo Kabushiki Kaisha: *See*—
Muramatsu, Tadao; and Yamamuro, Shinichi, 4,919,242, Cl. 192-4.00A.

Chupin, Guillaume; and Dandeville, Denis, to VIFE. Endless rotary band cleaning device, particularly for cleaning a conveyor belt or supporting surfaces of objects. 4,918,778, Cl. 15-97.00R.

Chupka, David E.; and Phillippe, Irenee J., to Black Clawson Company, The. Screening apparatus for paper making stock. 4,919,797, Cl. 209-273.000.

Church & Dwight Co., Inc.: *See*—
Kurtz, Andrew D.; and Winston, Anthony E., 4,919,910, Cl. 423-422.000.

Ciba-Geigy Corporation: *See*—
Bohner, Beat; and Meyer, Willy, 4,920,223, Cl. 544-182.000.
Gehret, Jean-Claude, 4,920,148, Cl. 514-450.000.
Lambie, Ian A.; Yarrow, Paul I. W.; Langley, Robert; and Campbell, Colin D., 4,920,217, Cl. 540-135.000.
Manser, Aloysius H.; Strasilla, Dieter; and Mulhaupt, Rolf, 4,920,182, Cl. 525-438.000.
Meier, Hans R.; and Evans, Samuel, 4,919,832, Cl. 252-50.000.
Miles, Peter, 4,919,833, Cl. 252-77.000.
Moser, Hans, 4,919,704, Cl. 71-96.000.
Moser, Hans; and Vogel, Christian, 4,919,709, Cl. 71-118.000.
Phaff, Rox, 4,920,220, Cl. 544-90.000.
Schafer, Horst; Kosmehl, Gerhard; and Neumann, Walter, 4,920,184, Cl. 525-477.000.

Ciluck Co., Ltd.: *See*—
Seki, Masao; and Higashino, Hiroki, 4,919,710, Cl. 55-417.000.

Cimino, John J., to Cimino, John J. Ski locator device utilizing a foam ball. 4,919,452, Cl. 280-809.000.

Circon Corporation: *See*—
Grossi, Benedetto; and Bracci, Thomas W., 4,919,131, Cl. 606-46.000.

Cirket, Morgan T.; and Duly, Michael J., to Soniform, Inc. Cam buckle. 4,918,790, Cl. 24-71.00R.

Classen, Henning J., to Nordson Corporation. Device for applying a flowable coating mass. 4,919,072, Cl. 118-666.000.

Claramonte, Manuel P.: *See*—
Martin, Gerard M.; Claramonte, Manuel P.; Auffret, Jean-Claude; Bonnet, Guy M.; and Delarue, Jean-Jacques, 4,919,900, Cl. 422-245.000.

Clark, Edward T.; and Ferrer, Enrique, to Motorola, Inc. Gallium arsenide antenna switch. 4,920,285, Cl. 307-571.000.

Clark, Gary S.: *See*—
Gembarosky, Michael P.; Clark, Gary S.; Baybrook, Howard E.; and Trudgeon, Arthur E., 4,919,465, Cl. 294-67.200.

Clark, Peter D.; Gilbert, John A.; Ott, Gunther; Ruhl, Dieter; and Santure, David J. Electrocoating composition of a polyamine self-condensed epoxy adduct and coatings produced thereby. 4,920,162, Cl. 523-400.000.

Clarke, Donald A.; Reynolds, Rodger L.; and Pryor, Timothy R., to Diffracto Ltd. Panel surface flaw inspection. 4,920,385, Cl. 356-237.000.

Clements, Philip E., to Zirco, Inc. Voltage inverter. 4,920,470, Cl. 363-21.000.

Clenin, Roger J.: *See*—
Trivino Vazquez, Fernando; and Clenin, Roger J., 4,919,722, Cl. 106-97.000.

Cleveland Clinic Foundation, The: *See*—
Bretan, Peter D., Jr., 4,920,044, Cl. 435-1.000.

Cline, Jack B.; and Ammerman, Stephen W. Single use syringe. 4,919,655, Cl. 604-110.000.

Clintberg, Carl. Sucker rod guide bearing. 4,919,202, Cl. 166-176.000.

Clore, John N.: *See*—
Nestler, John E.; Barlascini, Cornelius O.; Clore, John N.; and Blackard, William G., 4,920,115, Cl. 514-178.000.

Cloros Company, The: *See*—
Chen, Loren; van Buskirk, Gregory; Peterson, David; and Iliff, Robert J., 4,919,834, Cl. 252-90.000.

Co-Gen Power Corporation: *See*—
Edwards, Raymond S., 4,919,686, Cl. 48-197.00R.

Cogan, Adrian I.: *See*—
Blanchard, Richard A.; and Cogan, Adrian I., 4,920,388, Cl. 357-23.400.

Cogema: *See*—
Chotard, Alain, 4,919,884, Cl. 376-419.000.

Coggins, Carlos; and McCauley, Patrick O. Golf swing guide with backswing indicator. 4,919,432, Cl. 273-191.00A.

Cogswell, Frederic N.: *See*—
Blundell, David J.; Cogswell, Frederic N.; and Meakin, Peter J., 4,919,992, Cl. 428-131.000.

Cohen, David. Proximity detector mine system. 4,919,051, Cl. 102-404.000.

Colangelo, Robert V., to American Colloid Company. Article for sealing well castings in the earth. 4,919,989, Cl. 428-65.000.

Colart, Andre H. Psychomotricity test-toy. 4,919,423, Cl. 273-109.000.

Colas, Etienne G.; and Yi-Yan, Alfredo, to Bell Communications Research, Inc. Graded-index waveguides. 4,919,504, Cl. 350-96.120.

Cole, B. Harrison; Kroeger, Donald C.; and Wilson, Mark E., to Spectrum Consumer Products Co., Inc. Non-alcoholic mouthwash. 4,919,918, Cl. 424-44.000.

Cole, Gregory: *See*—
McCoy, William C.; Small, James E.; and Cole, Gregory, 4,918,919, Cl. 60-528.000.

Colgate Palmolive Co.: *See*—
Barletta, Gualtiero; and Bianchi, Antonio, 4,919,847, Cl. 252-558.000.
Durbut, Patrick; Mehreteab, Ammasuel; Mondin, Myriam; and Broze, Guy, 4,919,839, Cl. 252-153.000.

Collins, G. Robert: *See*—
Ruetman, Sven H.; Anand, Joginder N.; and Collins, G. Robert, 4,920,167, Cl. 524-155.000.

Colton, Buddy A.: *See*—
Whitenack, Joan E.; Sanchez, George; Stone, Earlyn W.; and Colton, Buddy A., 4,920,251, Cl. 219-401.000.

Columbia in the City of New York, The Trustees of: *See*—
Breslow, Ronald; Brandl, Michael; Adams, Alan D.; and Hunger, Jurgen, 4,920,216, Cl. 540-110.000.

Colwell, Robert P.; O'Donnell, John; Papworth, David B.; and Rodman, Paul K., to Multiflow Computer, Inc. Virtual address table look aside buffer miss recovery method and apparatus. 4,920,477, Cl. 364-200.000.

Combustion Engineering, Inc.: *See*—
Bryan, William J., 4,919,883, Cl. 376-352.000.

Comeau, Paul E.; DeBeau, John M.; and Torti, Anthony, to Kenney Manufacturing Company. Headrail and bracket combination for supporting blinds. 4,919,185, Cl. 160-178.100.

Commercial and Architectural Products, Inc.: *See*—
Bodurow, Constance C.; Murphy, Larry D.; and Perry, Gordon R., 4,918,879, Cl. 52-36.000.

Comotto, Michael: *See*—
Willrett, Douglas L.; and Comotto, Michael, 4,919,942, Cl. 426-38.000.

Compagnie Europeenne du Zirconium - CEZUS: *See*—
Desruelles, Didier; Bodin, Andre ; and Moinard, Philippe, 4,918,989, Cl. 73-627.000.

Computer Science Inovations, Inc.: *See*—
Bartlett, Homer E.; and Gallagher, Kevin P., 4,920,351, Cl. 343-756.000.

Comsat Telesystems, Inc.: *See*—
McGuire, William H.; and Tilden, Thomas J., 4,920,350, Cl. 343-709.000.

Connelly Containers, Inc.: *See*—
Heaps, Harry D., Jr.; and Boy, Charles E., 4,919,306, Cl. 222-105.000.

Conoco Inc.: *See*—
Page, Gary L., 4,918,894, Cl. 52-506.000.

Conrad, Neal; Burchill, Michael T.; Silbermann, Joseph; Hoffman, Thomas; and Bourrel, Maurice, to M & T Chemicals Inc. Process for surface modification of polymer articles. 4,919,972, Cl. 427-160.000.

Consarc Corporation: *See*—
Roberts, Raymond J., 4,919,712, Cl. 75-10.240.

Conseil Vente Service: *See*—
Kakko-Chiloff, Nicolas, 4,919,046, Cl. 101-143.000.

Consler, Donald; and Federico, Joseph B., to Paragon Patent Development Inc. Reusable package strap handle. 4,919,466, Cl. 294-170.000.

Constant, James N. Gravitational mass detector. 4,920,313, Cl. 324-301.000.

Container Corporation of America: *See*—
O'Brien, Patrick J., 4,919,313, Cl. 222-541.000.

Continental Conveyor & Equipment Company, Inc.: *See*—
Morrison, Thomas E., 4,919,253, Cl. 198-501.000.

Contraves AG: *See*—
Eng, Peter, 4,919,036, Cl. 89-37.110.

Contraves Goerz Corporation: *See*—
McSparran, Lloyd W., 4,920,291, Cl. 310-90.500.

Cook, Gary M., to PC Connection, Inc. Computer remote control through a video signal. 4,920,503, Cl. 364-521.000.

Cook, William P., to International Business Machines Corporation. Paper handling for repetitive movement of variable length media through an image transfer station. 4,920,383, Cl. 355-311.000.

Cooper Industries, Inc.: *See*—
Coutre, Leonard J., 4,919,625, Cl. 439-118.000.
Kincaid, John W., 4,920,233, Cl. 174-36.000.
Miller, James O., 4,919,459, Cl. 285-140.000.

Cooper, Joseph E.: *See*—
Pecoraro, George A.; Shelestak, Larry J.; and Cooper, Joseph E., 4,919,697, Cl. 65-134.000.
Pecoraro, George A.; Shelestak, Larry J.; and Cooper, Joseph E., 4,919,700, Cl. 65-134.000.

Coots, Robert J.: *See*—
Grubbs, Robert H.; Coots, Robert J.; and Pine, Stanley H., 4,919,151, Cl. 128-898.000.

Copa, William M.; and Vollstedt, Thomas J., to Zimpro/Passavant Inc. Two-stage anaerobic/aerobic treatment process. 4,919,815, Cl. 210-603.000.

Cope, Richard E., to National Research Development Corporation. Clod crumbler. 4,919,211, Cl. 172-69.000.

Cordell, Barbara: *See*—
Dale, Beverly; and Cordell, Barbara, 4,920,213, Cl. 536-27.000.

Cormier, Leonard N., to MMI Incorporated. Heat resistive wall assembly for a space vehicle. 4,919,366, Cl. 244-160.000.

Corning Incorporated: *See*—
Beall, George H.; and Quinn, Candace J., 4,920,081, Cl. 501-47.000.

Danielson, Paul S., 4,920,082, Cl. 501-59.000.
Gadkaree, Kishor P., 4,919,991, Cl. 428-113.000.
Hoke, Duane E.; Kimball, Ronald L.; and Quinn, David E., 4,919,510, Cl. 350-96.210.
Cote, William J.: *See*—
Bausmith, Robert C.; Cote, William J.; Cronin, John E.; Holland, Karey L.; Kaanta, Carter W.; Lee, Pei-Ing P.; and Wright, Terrance M., 4,919,750, Cl. 156-643.000.
Cottam, Graham D.: *See*—
Moore, Bruce L.; and Cottam, Graham D., 4,918,826, Cl. 33-645.000.
Cotter, Richard; Johnson, Robert C.; Ward, Michael; Madsen, David C.; Valicenti, Anthony J.; Menard, Michael P.; and Tucker, Hugh N., to Baxter International Inc. Nutritional support or therapy for individuals at risk or under treatment for atherosclerotic vascular, cardiovascular, and/or thrombotic diseases. 4,920,098, Cl. 514-2.000.
Cottle, Douglas J.; and Helton, Andrew C. Observation dome for buildings. 4,918,881, Cl. 52-65.000.
Cottrell, Ian W.: *See*—
Cho, James R.; Smith, Terry E.; and Cottrell, Ian W., 4,920,145, Cl. 514-420.000.
Council, Malcolm N.: *See*—
Baker, Walter; and Council, Malcolm N., 4,919,204, Cl. 166-223.000.
Couse, Robert F.; and Mercer, Patrick G., to Syquest Technology. Disc drive fine servo velocity control and method for head positioning relative to a disc. 4,920,462, Cl. 360-78.040.
Coutandin, Jochen; Theis, Jurgen; Groh, Werner; and Herbrechtsmeier, Peter, to Hoechst Aktiengesellschaft. Process for producing an optical coupler for polymer optical waveguides. 4,919,851, Cl. 264-1.500.
Coutre, Leonard J., to Cooper Industries, Inc. Track lighting apparatus. 4,919,625, Cl. 439-118.000.
Covey, James H., to Boeing Company, The. Conductive bonding of composite structures. 4,920,449, Cl. 361-216.000.
Covey, Robert L., to General Electric Company. Single mode optical fiber coupler. 4,919,506, Cl. 350-96.180.
Cowger, Bruce, to Hewlett-Packard Company. Volumetrically efficient ink jet pen capable of extreme altitude and temperature excursions. 4,920,362, Cl. 346-140.00R.
Crackett, Peter H.: *See*—
Attwood, Michael R.; Crackett, Peter H.; and Lawton, Geoffrey, 4,920,119, Cl. 514-243.000.
Creative Design and Packaging Cardiff Limited: *See*—
Young, Michael E.; Edwards, David M.; and Lyons, Robin; S., 4,919,268, Cl. 206-509.000.
Cremer, Heinz P.: *See*—
Deegener, Elmar; Wolsiefer, Harald; and Cremer, Heinz P., 4,919,488, Cl. 297-468.000.
Crepa, John L.; and Kelley, Matthew O., to Herr:y Filters, Inc. Roller/-squeezer deliquifier. 4,919,824, Cl. 210-770.000.
Cress, John E. Rotatable disk teaching apparatus. 4,920,033, Cl. 434-198.000.
Crigler, John: *See*—
Davis, Edgar A.; Watts, Richard L.; and Crigler, John, 4,918,887, Cl. 52-223.00L.
Croket, Frank M., to Halico Fabricators, Inc. Filter apparatus and method for separating contaminants from liquids. 4,919,825, Cl. 210-783.000.
Croll, Theodore P. Orthodontic band cap. 4,919,615, Cl. 433-3.000.
Croll, Theodore P. Dental spatula with display posts. 4,919,616, Cl. 433-26.000.
Cronin, John E.: *See*—
Bausmith, Robert C.; Cote, William J.; Cronin, John E.; Holland, Karey L.; Kaanta, Carter W.; Lee, Pei-Ing P.; and Wright, Terrance M., 4,919,750, Cl. 156-643.000.
Crooks, James M. Capacitor discharge strobe light. 4,920,301, Cl. 315-241.00S.
Cross, Barrington: *See*—
Los, Marinus; Ladner, David W.; and Cross, Barrington, 4,920,226, Cl. 546-80.000.
Crouzet: *See*—
Marty, Jacques; Tremblet, Jerome; and Delorme, Jean-Jacques, 4,920,256, Cl. 235-441.000.
Crouzet (Socie te Anonyme francaise): *See*—
Lescourret, Jean-Louis, 4,920,317, Cl. 324-318.000.
Crowe, Kim C.: *See*—
Heldebrant, Charles M.; Crowe, Kim C.; Groveman, George R.; and Davis, Charles H., Jr., 4,919,895, Cl. 422-129.000.
Crump, Gregory A. Magnetic golf club holding apparatus. 4,919,279, Cl. 211-70.200.
Cubic Designs Inc.: *See*—
Otte, Donald R.; and Krueger, Steven E., 4,919,394, Cl. 256-65.000.
Cude, Richard J.; and King, Joseph N. T-handle turner. 4,918,784, Cl. 16-114.00R.
Cullen, Walter P.; Hauske, James R.; Kostek, Gloria J.; Maeda, Hiroshi; and Tone, Junsuke, to Pfizer Inc. Acidic polycyclic ether antibiotic. 4,920,050, Cl. 435-119.000.
Culver, William P. Combination window envelope and insert and method of using same. 4,919,325, Cl. 229-71.000.
Cunningham, Ernest R., to Grip-Pak, Inc. Package unit of can-type containers. 4,919,260, Cl. 206-150.000.
Curtis, Robert L.: *See*—
Makiyo, Minoru; Goto, Shigenori; Yokosuka, Hiroshi; Curtis, Robert L.; and Wade, Philip J., 4,920,236, Cl. 174-77.00R.
Cartze, Jurgen; Schroder, Ludwig; and Briner, Paul H., to Shell Internationale Research Maatschappij B.V. Preparation of 3,3-diarylacrylic acid amides. 4,920,222, Cl. 344-158.000.
Cussot, Christian; and Delage, Jean-Didier, to Societe Francaise Bitumastic. Colored and wear-resistant decorative coating based on epoxy resin and for use on floors and on panels, and method of obtaining it. 4,920,002, Cl. 428-325.000.
D-Three Co., Ltd.: *See*—
Imazeki, Yukio; and Yamaguchi, Hideo, 4,919,546, Cl. 383-33.000.
Dage, Richard C.: *See*—
Jones, Winton D.; Dage, Richard C.; and Schnettler, Richard A., 4,920,229, Cl. 546-283.000.
Dahlgren, Lennart. Water toy. 4,919,636, Cl. 446-159.000.
Daicel Chemical Industries, Ltd.: *See*—
Ichimura, Kunihiro; and Kubo, Keiji, 4,920,030, Cl. 430-270.000.
Daido Tokushuko Kabushiki Kaisha: *See*—
Sugiura, Saburo; Fujita, Senji; Nakata, Hiroya; Okamoto, Tetsuo; Inagaki, Yoshio; Mizuguchi, Keiichi; and Ishii, Atsushi, 4,919,714, Cl. 75-529.000.
Daikin Industries, Ltd.: *See*—
Miki, Kenichi; and Kotake, Yoichiro, 4,918,918, Cl. 60-489.000.
Daimler-Benz AG: *See*—
Bonfert, Helmut; Hardt, Thomas; Klumpp, Rolf; and Wagner, Wolf-Dietrich, 4,919,371, Cl. 248-56.000.
Lay, Kurt; and Sailer, Erwin, 4,919,986, Cl. 428-43.000.
Leiber, Heinz; Klinkner, Walter; and Haid, Robert, 4,919,444, Cl. 280-707.000.
Dainippon Ink and Chemicals, Inc.: *See*—
Anazawa, Takanori; Hasumi, Kazuo; and Ono, Yoshiyuki, 4,919,856, Cl. 264-22.000.
Dainippon Screen Mfg. Co., Ltd.: *See*—
Isono, Koichi; Towohisa, Kunio; Oka, Junichi; and Sakamoto, Takashi, 4,920,430, Cl. 358-481.000.
Kitagawa, Kunio; Maeda, Akira; and Matsumura, Yoshio, 4,919,614, Cl. 432-259.000.
Kobayashi, Atsuo; Yamada, Takuma; and Akao, Kiyoshi, 4,919,073, Cl. 118-688.000.
Dairy Research, Inc.: *See*—
Ahmed, Salah H.; Kadlec, John D.; and Luksas, Anthony J., 4,919,960, Cl. 426-580.000.
Daito, Toshiji: *See*—
Hosaka, Sumio; Amaya, Toshiyuki; Daito, Toshiji; Itoh, Hiroshi; and Jinguji, Takumi, 4,920,424, Cl. 358-343.000.
Daiwa Golf Co., Ltd.: *See*—
Sato, Koji, 4,919,420, Cl. 273-81.00B.
Daiwa Manufacturing Co. Ltd.: *See*—
Uehara, Kenichi; and Tomioka, Hisashi, 4,919,376, Cl. 248-185.000.
Dale, Beverly; and Cordell, Barbara, to Biotechnology Research Partners, Ltd. Method and compositions useful in preventing equine influenza. 4,920,213, Cl. 536-27.000.
Dale, James B.: *See*—
Beachey, Edwin H.; and Dale, James B., 4,919,930, Cl. 424-88.000.
Dale, James L.; Burkinshaw, Brain D.; and Burkhead, Wayne Z., to Intermedics Orthopedics, Inc. Modular humeral prosthesis. 4,919,670, Cl. 623-19.000.
Dallons, Robert E.: *See*—
Fortune, William S.; and Dallons, Robert E., 4,919,322, Cl. 228-20.000.
Daly, Daniel T.: *See*—
DeBlase, Frank J.; Daly, Daniel T.; Sung, Rodney L.; and Wetherbee, Clifton W., 4,920,058, Cl. 436-85.000.
Damon Biotech, Inc.: *See*—
Edmunds, Timothy; and Foley, Susan F., 4,920,051, Cl. 435-215.000.
Dana Corporation: *See*—
Flotow, Richard A., 4,919,243, Cl. 192-18.00R.
Dandeville, Denis: *See*—
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Daneels, Guido F. T.: *See*—
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Daniel, Robert. Multiple sample holder indexing means and method of using same. 4,919,894, Cl. 422-104.000.
Danieli & C. Officine Meccaniche SpA: *See*—
DiGiusto, Bruno, 4,918,803, Cl. 29-33.00C.
Daniels, Donald V.: *See*—
Brown, David A.; Daniels, Donald V.; and Harrison, Joel N., 4,920,434, Cl. 360-77.080.
Daniels, Michael P.: *See*—
Chirhart, Dennis J.; Daniels, Michael P.; and Kneipp, Kenneth G., 4,919,741, Cl. 156-223.000.
Danielson, Paul S., to Corning Incorporated. Glasses exhibiting controlled fluoride release. 4,920,082, Cl. 501-59.000.
Danilov, Leonid I.: *See*—
Lipukhim, Jury V.; Danilov, Leonid I.; Garber, Eduard A.; and Subbotin, Anatoly N., 4,918,960, Cl. 72-40.000.
Danner, B. Lee: *See*—
Caulfield, J. Keith; Danner, B. Lee; and Milberger, Lionel J., 4,919,454, Cl. 285-18.000.
Daoud, Sami, to Tyndale Plains-Hunter Ltd. Hydrophilic polyurethane emulsions and materials produced therefrom. 4,920,172, Cl. 524-502.000.
Darby, Robert J.: *See*—
Powel, Stephen S.; and Darby, Robert J., 4,919,359, Cl. 242-125.100.

Darling, Andrew S.; and Testardi, Mark R. Method and apparatus for non-intrusive bit error rate testing. 4,920,537, Cl. 371-5.100.
Das, Sajal; Prevorsek, Dusan C.; Rhee, Seong K.; and Bulger, William J., to Allies-Signal Inc. Friction resistant composition. 4,920,159, Cl. 523-153.000.
Dasgupta, Purnendu K., to Dow Chemical Company, The. Apparatus and method for automated microbatch reaction. 4,920,056, Cl. 436-50.000.
Data General Corporation: *See*—
Pogue, Michael A.; Dempsey, Morgan J.; Shah, Shreyaunsh R.; and Waible, Leo C., III, 4,920,483, Cl. 364-200.000.
Davey, Roger J.; and MacKeron, Duncan H., to Imperial Chemical Industrices PLC. Dyesheets. 4,920,092, Cl. 503-227.000.
Davidson, David L.: *See*—
Brodsky, Bruce L.; Davidson, David L.; Hutton, Dwight L.; Vasiladiotis, William L.; and White, Mark D., 4,920,476, Cl. 364-140.000.
Davidson Textron Inc.: *See*—
Belleville, Ernest L., 4,919,559, Cl. 403-13.000.
Brault, Alfred; and Rosa-Miranda, Roberto, 4,919,069, Cl. 118-308.000.
Davis, Alan R.; and Hung, Paul P., to American Home Products Corporation. Oral vaccines. 4,920,209, Cl. 435-235.000.
Davis, Charles H., *Jr.*: *See*—
Heldebrant, Charles M.; Crowe, Kim C.; Groveman, George R.; and Davis, Charles H., Jr., 4,919,895, Cl. 422-129.000.
Davis, Dennis W.; Peterson, Ray D.; and Posey, Walter, Jr., to Reynolds Metals Company. Molten metal temperature probe. 4,919,543, Cl. 374-139.000.
Davis, Edgar A.; Watts, Richard L.; and Crigler, John, to VSL Corporation. Protective tendon tensioning anchor assemblies. 4,918,887, Cl. 52-223.00L.
Davis, Gail F.: *See*—
Stegemoeller, Calvin L.; and Davis, Gail F., 4,919,540, Cl. 366-132.000.
Davis, Gregory E. Paper buster. 4,919,990, Cl. 428-100.000.
Davis, James C., to Standard Oil Company, The. Affinity membranes having pendant hydroxy groups and processes for the preparation and use thereof. 4,919,811, Cl. 210-500.360.
Davis, Robert G.: *See*—
Cesare, Frank C.; Davis, Robert G.; and Sigworth, William D., 4,919,976, Cl. 427-373.000.
Davy McKee (London) Limited: *See*—
Wilkes, Peter R.; Scarlett, John; and Harrison, George E., 4,919,765, Cl. 203-64.000.
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Day, Fleming H., to Du Pont de Nemours, E. I., and Company. Ditridecyl sebacate tire yarn finish. 4,920,003, Cl. 428-391.000.
Dearlove, Thomas J.: *See*—
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DeBeau, John M.: *See*—
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DeBlase, Frank J.; Daly, Daniel T.; Sung, Rodney L.; and Wetherbee, Clifton W., to Texaco Inc. Method of predetermining the weight ratio of alkenyl succinimide reactants. 4,920,058, Cl. 436-85.000.
DeCamp, Howard S.; Raffo, John A.; and Bimanand, Alex Z., to Sierracin Corporation. Electrically conductive window and a method for its manufacture. 4,920,254, Cl. 219-547.000.
Deckner, George E.; and Kulkarni, Rupali A., to Richardson-Vicks Inc. Cosmetic sticks. 4,919,934, Cl. 424-401.000.
DeCloux, Richard J. Dual facing aerobic exercise machine. 4,919,416, Cl. 272-69.000.
Deeg, Emil W.: *See*—
Bowen, Terry P.; Deeg, Emil W.; Helm, James G.; and Stauffer, Larry R., 4,920,366, Cl. 350-96.200.
Deegener, Elmar; Wolsiefer, Harald; and Cremer, Heinz P., to Keiper Recaro GmbH & Co. Vehicle seat with a safety belt system. 4,919,488, Cl. 297-468.000.
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De Forest, Lockwood; Roberts, Ian D.; and Dixon, Christoper W. S., to Siddons Industries Limited. Heat exchanger. 4,918,938, Cl. 62-238.600.
Deguchi, Masaharu: *See*—
Sano, Kenji; Maruyama, Takesuke; Satoh, Hironobu; Deguchi, Masaharu; and Murakami, Toshio, 4,920,420, Cl. 358-227.000.
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Spindler, Manfred; and Tanner, Herbert, 4,919,945, Cl. 426-69.000.
Deiger, Anthony J. Container with improved retention properties and improved corner structures. 4,919,326, Cl. 229-109.000.
Delage, Jean-Didier: *See*—
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Dela Rosa, Guy: *See*—
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Delorme, Jean-Jacques: *See*—
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DelSavio, Eugene. Fire exit system. 4,919,235, Cl. 182-18.000.
Deltec Electronics Corporation: *See*—
Handler, Howard, 4,920,472, Cl. 363-95.000.
Demarest, Henry M., Jr., to PPG Industries, Inc. Method of making glass with preliminary reaction of batch materials. 4,920,080, Cl. 501-31.000.
De Mey, Jan R.: *See*—
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Demjanenko, Michael: *See*—
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Demoute, Jean-Pierre: *See*—
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Denda, Akira, to NEC Corporation. CMOS level converter circuit with reduced power consumption. 4,920,284, Cl. 307-475.000.
den Heijer, Ronald; Goverde, Godefridus C.; and Simons, Peter G. M., to U.S. Philips Corporation. Piston engine with dynamic groove bearing external to piston and isolated from compression space. 4,920,288, Cl. 310-15.000.
Den Hoed, Wilma: *See*—
Van Beek, Wilhelmus P.; Den Hoed, Wilma; Van Leeuwen, Willem A.; Poels, Eduard K.; and Visser, Cornelis, 4,920,089, Cl. 502-335.000.
Denk, Lawrence T.: *See*—
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Dennison Manufacturing Company: *See*—
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DeSousa, Daniel A.; Badley, William G.; and D'Innocente, Ralph, to Jacuzzi Whirlpool Bath. Air valve for spas and baths. 4,918,768, Cl. 4-542.000.
Desruelles, Didier; Bodin, Andre ; and Moinard, Philippe, to Compagnie Europeenne du Zirconium - CEZUS. Ultrasonic method of measuring the thickness of the plating on a metal tube, the corresponding apparatus and its application to Zr plated alloy tubes. 4,918,989, Cl. 73-627.000.
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Deuring, Hans; Maquire, James H.; Worsley, Clifford R.; and Whitehead, Martin J., to Goetze AG. Mounting aid for installing valve actuating elements. 4,919,090, Cl. 123-90.670.
Deutsche Thompson-Brandt GmbH: *See*—
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DeVolpi, Dean R. Security system for bicycles, ski racks and coat racks. 4,920,334, Cl. 340-568.000.
DeVore, Dale P.; Swann, David A.; and Sullivan, Bernard P., to Med-Chem Products, Inc. Sodium hyaluronate composition. 4,920,104, Cl. 514-54.000.
Devos, John B. Method of hardening and strengthening keratin and composition. 4,919,920, Cl. 424-61.000.
Dewar, Colin A.; and Artus, Kevin J., to Imperial Chemical Industries PLC. Films and tapes. 4,919,996, Cl. 428-221.000.
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Dick, Kevin H.: *See*—
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Dickson, Glen A.; and Gray, Donnie R. Chemical for bleaching textiles. 4,919,842, Cl. 252-186.430.

Dickson, Ronald, to Allied-Signal Inc. Locking pawl actuating means for emergency locking safety belt retractor. 4,919,355, Cl. 242-107.40A.

Diderichsen, Borge K., to Novo Industri A/S. Method for stabilizing extra-chromosomal elements in bacteria during cultivation. 4,920,048, Cl. 435-69.100.

Dietrich, Anton; Hartig, Klaus; and Szczyrbowski, Joachim, to Leybold-Heraeus GmbH. Process for the production of curve glazing with a high transmittance in the visible spectral range and a high reflectance for thermal radiation. 4,919,778, Cl. 204-192.270.

Dietschi, Carlo, to Sulzer Brothers Limited. Hemispherical prosthetic acetabulum. 4,919,675, Cl. 623-22.000.

Diffracto Ltd.: *See*—
Clarke, Donald A.; Reynolds, Rodger L.; and Pryor, Timothy R., 4,920,385, Cl. 356-237.000.

Digital Equipment Corporation: *See*—
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DiGiusto, Bruno, to Danieli & C. Officine Meccaniche SpA. Plant for rolling long products from billets and blooms coming from a plurality of continuous casting lines. 4,918,803, Cl. 29-33.00C.

DiGrande, John T.: *See*—
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D'Innocente, Ralph: *See*—
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Dischler, Louis, to Milliken Research Corporation. Method to soften fabric by air impingement. 4,918,795, Cl. 26-1.000.

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Diversified Optical Corp.: *See*—
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Dixit, Sunit S.: *See*—
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Dixon, Christoper W. S.: *See*—
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DNA Plant Technology Corporation: *See*—
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Doane, Wilton A., to Santa Barbara Medical Foundation Clinic. Catheter having a double lumen and a balloon and method of using the same for controlled operative cholangiography. 4,919,651, Cl. 604-96.000.

Dobberpuhl, Dale R.: *See*—
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Dobrinski, John W.; and Elliston, Thomas L. Well perforating device. 4,919,050, Cl. 102-307.000.

Dobruse, Daniel J.: *See*—
Liszka, Kenneth J.; Dobruse, Daniel J.; Potopa, Steve E.; Gammill, Charles E.; and Gammill, Jerry D., 4,918,805, Cl. 29-888.060.

Dobson, Robert L., to Goodyear Tire & Rubber Company, The. Self sealing pneumatic tire. 4,919,183, Cl. 152-502.000.

Dr.-Ing. Luder Gerking: *See*—
Walz, Alfred, 4,919,854, Cl. 264-12.000.

Doi, Kazuhiro, to Nissan Motor Co., Ltd. Vibration damping device utilizing electrorheopectic fluid. 4,919,402, Cl. 267-140.100.

Dollison, William W. Friction-reducing device. 4,919,205, Cl. 166-241.000.

Dolphin, David: *See*—
Levy, Julia G.; Dolphin, David; Chow, Jack K.; and Sternberg, Ethan, 4,920,143, Cl. 514-410.000.

Domagala, John M.; Hagen, Susan E.; and Kiely, John S., to Warner-Lambert Company. Antibacterial agents. 4,920,120, Cl. 514-254.000.

Domanski, Andrzej W.: *See*—
Bock, Wojtek J.; and Domanski, Andrzej W., 4,920,261, Cl. 250-225.000.

Donath, Sabine; Grund, Peter; Holz, Peter; Jakobs, Udo; and Volker, Wolfgang, to Messer Griesheim GmbH. Device to deburr molded parts subject to low-temperature brittleness. 4,918,876, Cl. 51-426.000.

Donnerhak, Bernd: *See*—
Kotowski, Stephan; Busse, Bernd; and Donnerhak, Bernd, 4,919,766, Cl. 204-153.100.

Dorn, Silvia, to R. Maag AG. Insecticidal compositions. 4,919,935, Cl. 424-405.000.

Dornier, Peter, to Lindauer Dornier Gesellschaft mbH. Air jet weaving loom with an expander having an extension. 4,919,171, Cl. 139-435.100.

Dorsey, John G.; Sentell, Karen B.; and Barnes, Karen W., to University of Florida. Ultrasound driven synthesis of reversed and normal phase stationary phases for liquid chromatography. 4,919,804, Cl. 210-198.200.

Doty, Gerald A.; and Johnson, Eric T., to Occupant Safety Systems Inc. Overt comfort system. 4,919,450, Cl. 280-803.000.

Douglas, Monte A.: *See*—
Wei, Che-Chia; Tang, Thomas E.; Bohlman, James G.; and Douglas, Monte A., 4,920,073, Cl. 437-200.000.

Dow Chemical Company, The: *See*—
Dasgupta, Purnendu K., 4,920,056, Cl. 436-50.000.
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Ruetman, Sven H.; Anand, Joginder N.; and Collins, G. Robert, 4,920,167, Cl. 524-155.000.
Smith, David A.; and Woody, Clark M., 4,919,415, Cl. 271-284.000.
Tiefenbach, Lawrence W., Jr., 4,918,874, Cl. 51-293.000.
Tiegs, Terry N.; and McDonald, Robert R., 4,919,718, Cl. 75-232.000.

Dowell Schlumberger Incorporated: *See*—
King, Milton T., 4,919,209, Cl. 166-300.000.

Downing, Leon A. Conveyor escapement. 4,919,251, Cl. 198-463.600.

Dowty Seals Limited: *See*—
Walker, Robin A., 4,919,969, Cl. 427-58.000.

Doyle, Thomas D.; Brunner, Charlotte A.; and Smith, Edward, to United States of America, Health and Human Services. Liquid chromatographic chiral stationary phase. 4,919,803, Cl. 210-198.200.

Drackett Company, The: *See*—
Holston, Sylvester; Ziek, Robert; and Woodruff, William, 4,918,903, Cl. 53-471.000.

Dreher, Mark L.: *See*—
Barry, David L.; Dreher, Mark L.; Johnson, Alan A.; and Schroeder, Otto E., 4,919,947, Cl. 426-94.000.

Drew, James H., III. Sectional bench. 4,919,480, Cl. 297-244.000.

Drocco, Amabile, to Jacobacci-Casetta & Perani. Kneading machine, particularly for food products. 4,919,539, Cl. 366-94.000.

Dromi, Asher: *See*—
Keidar, Itzhak; Dromi, Asher; and Tilman, Menahem, 4,919,427, Cl. 273-155.000.

Drug Delivery Systems Inc.: *See*—
Sibalis, Dan, 4,919,648, Cl. 604-20.000.

Druschke, Wolfgang: *See*—
Schulz, Guenther; Druschke, Wolfgang; and Jaeger, Helmut, 4,920,157, Cl. 522-96.000.

Drushel, Ronald H.: *See*—
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Dubech, Gerard, to MECAERO, S.A. Loss-proof fastener and constituent part. 4,919,581, Cl. 411-353.000.

Dubensky, William J.: *See*—
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Dubiel, George T.: *See*—
Bridges, Jack E.; Dubiel, George T.; and Bajzek, Thomas J., 4,919,201, Cl. 166-60.000.

Duelli, Heinz, to Robert Bosch GmbH. Device for improving mixture distribution in an intake tube of a combustion engine. 4,919,105, Cl. 123-590.000.

Duerr, Wilhelm; and Oppelt, Ralph, to Siemens Aktiengesellschaft. Method and apparatus for measuring electrical or magnetic fields. 4,920,522, Cl. 367-134.000.

Duff, Terry L.; and Gundlach, William R. Movable gondola shelving with hidden shelf adjustment mechanism. 4,919,282, Cl. 211-134.000.

Dufresne, Michel; Sammoun, Samir; Gregory, Dave; Champagne, Jean-Paul; Tessier, Alain; Scott, Pierre; and Methot, Francois, to Videotron LTEE. CATV subscriber terminal transmission control. 4,920,533, Cl. 370-85.200.

Duhamel, Pierre: *See*—
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Duly, Michael J.: *See*—
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Duncan, Charles S.: *See*—
Seidensticker, Raymond G.; Kochka, Edgar L.; and Duncan, Charles S., 4,919,901, Cl. 422-249.000.

Dunmore Corporation: *See*—
Lackey, Donald V., 4,920,452, Cl. 361-305.000.

Duphar International Research B.V.: *See*—
Wellinga, Kobus; and Wulder, Rudolf, 4,920,135, Cl. 514-344.000.

Du Pont de Nemours, E. I., and Company: *See*—
Day, Fleming H., 4,920,003, Cl. 428-391.000.
Fintel, William A., 4,919,872, Cl. 264-103.000.
George, Daniel E., 4,920,177, Cl. 525-195.000.
Green, James R., 4,920,000, Cl. 428-288.000.
Hay, James V.; and Wolf, Anthony D., 4,919,706, Cl. 71-90.000.
Hopkins, Mark W.; and Principe, Frank S., 4,919,490, Cl. 301-63.0PW.

Lee, Chi-Chang; and Simpson, Penny C., 4,920,001, Cl. 428-289.000.
Lemke, Timothy A., 4,920,234, Cl. 174-36.000.
Skeirik, Richard D., 4,920,499, Cl. 364-513.000.
Wang, Teh-Chuan, 4,919,875, Cl. 264-171.000.
Warner, Grant H., 4,918,912, Cl. 57-255.000.
Windley, William T., 4,919,874, Cl. 264-168.000.
Zatkulak, Tony D.; Rodini, David J.; and Hodge, James D., 4,919,869, Cl. 264-78.000.
du Quesne, Francis. Lever for removing motorcar tires. 4,919,184, Cl. 157-1.300.
Durbut, Patrick; Mehreteab, Ammanuel; Moudin, Myriam; and Broze, Guy, to Colgate Palmolive Co. Light duty microemulsion liquid detergent composition containing an anionic/cationic complex. 4,919,839, Cl. 252-153.000.
Durkoppwerke GmbH: *See*—
Riss, Gerhard, 4,919,061, Cl. 112-70.000.
Duroux, Bernard, to Britax (GECO) S.A. Hydraulic remote control device for controlled members, such as external rear view mirrors on vehicles. 4,918,920, Cl. 60-536.000.
Durst Phototechnik GmbH: *See*—
Vinatzer, Alex, 4,920,378, Cl. 355-68.000.
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Stoy, Michael A.; Dusek, Vaclav; Patel, Anilbhai S.; and Herriott, Ray G., 4,919,130, Cl. 606-107.000.
Dutka, Walter J. Inflatable tubular structure. 4,918,877, Cl. 52-2.00J.
Dyer, David F. Add-on refrigerant boiler for electric heat pump. 4,918,933, Cl. 62-79.000.
Dyer, Maurice J.: *See*—
Ford, John W.; and Dyer, Maurice J., 4,919,319, Cl. 226-197.000.
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Dyksterhouse, Robert; Dyksterhouse, Joel A.; Handermann, Alan C.; and Western, Edward D., 4,919,739, Cl. 156-181.000.
Dyksterhouse, Robert; Dyksterhouse, Joel A.; Handermann, Alan C.; and Western, Edward D., to BASF Aktiengesellschaft. Production of improved preimpregnated material comprising a particulate thermosetting resin suitable for use in the formation of a substantially void-free fiber-reinforced composite article. 4,919,739, Cl. 156-181.000.
Dynamit Nobel Aktiengesellschaft: *See*—
Bender, Richard; and Scheiderer, Gerrit, 4,919,897, Cl. 422-165.000.
Dynaquip Controls Corporation: *See*—
Hartmann, Leonard J.; and Weller, Michael E., 4,919,334, Cl. 239-600.000.
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Eacobacci, Michael J.: *See*—
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Eagle, Christopher R., to Portals Engineering Limited. Label applying devices for applying adhesive labels to articles. 4,919,747, Cl. 156-497.000.
Eardley, Richard A.; Keenan, Brian J.; Lawson, Ian A.; and McAllister, John, to International Business Machines Corporation. Membrane keyboards. 4,920,237, Cl. 200-5.00A.
Easterly, Robert W., to Eastman Kodak Company. Zoom lens focus control device for film video player. 4,920,419, Cl. 358-214.000.
Eastern Company, The: *See*—
Pastva, John V., 4,918,866, Cl. 49-381.000.
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Smith, Redd H.; and Lund, Jeffrey B., 4,919,013, Cl. 76-108.200.
Eastman Kodak Company: *See*—
Agarwala, Ashok K., 4,920,326, Cl. 335-284.000.
Bagchi, Pranab, 4,920,004, Cl. 428-407.000.
Barbee, Robert B., 4,920,008, Cl. 428-458.000.
Easterly, Robert W., 4,920,419, Cl. 358-214.000.
Goebel, William K.; and Rakov, David M., 4,920,356, Cl. 346-1.100.
Katerberg, James A., 4,920,355, Cl. 346-1.100.
Mahoney, Gregory P., 4,920,381, Cl. 355-260.000.
Mills, Borden H.; and Cahill, David F., 4,920,382, Cl. 355-284.000.
Reafler, Gerald G., 4,918,800, Cl. 29-527.200.
Sullivan, James R.; and Miller, Rodney L., 4,920,501, Cl. 364-518.000.
Urban, Carl T., 4,920,250, Cl. 219-216.000.
Eaton Corporation: *See*—
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Eaton, David C., to Rieter Scragg Limited. Yarn quality monitoring method and apparatus. 4,918,914, Cl. 57-264.000.
Eaton, Homer L. Article positioning apparatus. 4,918,817, Cl. 33-1.00M.
Ebara Research Co., Ltd.: *See*—
Murakami, Chikara; Nakajima, Atsushi; Hiyama, Hirokuni; Inanaga, Satoshi; and Watanabe, Katsuhide, 4,920,290, Cl. 310-90.500.
Ebbott, Henry M.: *See*—
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Eberhard, Jeffrey W.; and Hedengren, Kristina H., to General Electric Company. Enhancement of image quality by utilization of a priori information. 4,920,491, Cl. 364-413.190.
Ebert, Wolfgang; Haese, Wilfried; Vogelsgesang, Roland; and Dhein, Rolf, to Bayer Aktiengesellschaft. Optical fibres based on polycarbonate fibres, and a process for the production thereof. 4,919,514, Cl. 350-96.340.
Ebihara, Masaaki; and Nomura, Kyosuke, to Taisei Corporation. Method of detecting a defective position in a cement intimate mixture filled portion in a building. 4,918,988, Cl. 73-594.000.
Edinger, Travis H.: *See*—
Paschke, Robert A.; Mosel, James A.; Kratsch, Charles H.; White, Dean; and Edinger, Travis H., 4,918,878, Cl. 52-28.000.
Edmunds, Timothy; and Foley, Susan F., to Damon Biotech, Inc. Recovery of urokinase compounds. 4,920,051, Cl. 435-215.000.
Edwards, Arthur J.; and Gray, Randall C., to Motorola, Inc. Regulator for automotive charging systems. 4,920,308, Cl. 322-58.000.
Edwards, David M.: *See*—
Young, Michael E.; Edwards, David M.; and Lyons, Robin; S., 4,919,268, Cl. 206-509.000.
Edwards, Raymond S., to Co-Gen Power Corporation. Process for the pyrolytic production of synthetic gas. 4,919,686, Cl. 48-197.00R.
EG&G, Inc.: *See*—
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EG&G Pressure Science, Inc.: *See*—
Halling, Horace P.; and Oh, Thomas S., 4,919,453, Cl. 285-3.000.
Egger, Shawn E.; and Sherman, Harold G., to Egger, Shawn E. Apparatus for remotely controlled movement through tubular conduit. 4,919,223, Cl. 180-8.100.
Eggers, Derek C.; Holben, David V.; and Robinson, Mark E. System for random access to an audio video data library with independent selection and display at each of a plurality of remote locations. 4,920,432, Cl. 360-33.100.
Eggler, James F.; Johnson, Michael R.; and Melvin, Lawrence S., *Jr.*, to Pfizer Inc. Substituted decahydro-1H-pyrido[1,2-f]phenanthridines and decahydropyrrolo[1,2-f]phenanthridines. 4,920,221, Cl. 544-125.000.
Egloff, Heinz, to Siemens Medical Systems, Inc. Method and apparatus for reducing base field shifts in a magnetic resonance device due to pulsed magnetic field gradients. 4,920,316, Cl. 324-318.000.
Ehluss, Heinz-Gunter; Wessel, Erich; and Oldach, Uwe, to Blohm & Voss AG. Hydraulic system for ship rudder roll stabilization and steering. 4,919,064, Cl. 114-150.000.
Eiberger, Berthold, to BTS Broadcast Television Systems GmbH. Broadband magnetic tape recording with compensation for bandwidth changes related to data rate. 4,920,461, Cl. 360-68.000.
Eichelberger, Charles W.; and Wojnarowski, Robert J., to General Electric Company. Multichip integrated circuit packaging method. 4,918,811, Cl. 29-840.000.
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Buysch, Hans-Josef; Schon, Norbert; Kress, Hans-Jurgen; Eichenauer, Herbert; and Buekers, Josef, 4,920,166, Cl. 524-141.000.
Schmidt, Adolf; Hendricks, Udo; Bomer, Bruno; Ott, Karl-Heinz; Eichenauer, Herbert; and Pischtschan, Alfred, 4,920,181, Cl. 525-327.500.
Eigenbrod, Lester K., to Harsco Corporation. Cryogenic liquid container. 4,918,927, Cl. 62-45.100.
Eisermann, Armin. Lock with locking function released by insertion of a coded card. 4,918,957, Cl. 70-276.000.
Eka Nobel AB: *See*—
Mansson, Inge, 4,919,755, Cl. 162-83.000.
Electric Avenue, Inc.: *See*—
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Gidda, Jaswant S.; Kirst, Herbert A.; and Robertson, David W., 4,920,102, Cl. 514-28.000.
Kirst, Herbert A.; and Leeds, James P., 4,920,103, Cl. 514-30.000.
Elliston, Thomas L.: *See*—
Dobrinski, John W.; and Elliston, Thomas L., 4,919,050, Cl. 102-307.000.
Elluin, Patrice; Verrecchia, Pascal; Mauer, Georges; and Cardon, Philippe, to Societe d'Administration et de Realisations d'Investissements (SARI). Air-processing installation designed for the ventilation and air-conditioning of several rooms and air-processing module designed for an installation of this type. 4,919,327, Cl. 236-49.100.
Elmer, Werner; and Schmitt, Michael, to Texas Instruments Incorporated. High speed, low noise integrated circuit. 4,920,283, Cl. 307-443.000.
Elmgren, Peter J.; Emerick, Alan J.; Rivenburg, Dennis L., Sr.; Saraiya, Mukund K.; and Sissenstein, David W., Jr., to International Business Machines Corporation. Solder paste for use in a reducing atmosphere. 4,919,729, Cl. 148-24.000.
Ely, Ralph L., Jr., to Kelyx, Inc. Rotationally and translationally pivotable balancing assembly. 4,919,380, Cl. 248-311.200.
Emco Wheaton, Inc.: *See*—
Podgers, Alexander R., 4,919,305, Cl. 222-55.000.
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Emhart Industries, Inc.: *See*—
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Emori, Shinji: *See*—
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EMS Holland B.V.: *See*—
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Endo, Hiroyuki: *See*—
Abe, Makoto; Tanimoto, Ichiro; Fujiki, Akira; Suzuki, Keitaro; Endo, Hiroyuki; and Ikenoue, Yutaka, 4,919,719, Cl. 75-243.000.

Endo, Itaru: *See*—
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Endo, Satoru: *See*—
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Endo, Seiji; Kobayashi, Osamu; and Kamimura, Masatsugu, to Fujitsu Limited. Delta-sigma modulator. 4,920,544, Cl. 375-26.000.

Endoh, Yasuo: *See*—
Okubo, Toshimitsu; Kobayashi, Kazuyoshi; Ohmura, Kohki; Sai, Yoshinobu; Satoh, Takuo; Yoshino, Yukihiko; Hoshi, Nobuyuki; Onodera, Takayuki; Endoh, Yasuo; Irokawa, Sigenobu; and Sannohe, Toshiaki, 4,919,045, Cl. 101-142.000.

Eng, Peter, to Contraves AG. Arresting apparatus for fixation of an adjusted position. 4,919,036, Cl. 89-37.110.

Engel, Aloysius, to Bayer Aktiengesellschaft. Basic azo dyestuffs. 4,920,208, Cl. 534-753.000.

Engel, Georg; and Haberer, Ernst-August, to SMS Schloemann-Siemag Aktiengesellschaft. Adjusting mechanism for a universal stand. 4,918,964, Cl. 72-225.000.

Engels, Edward E. Device for attaching a license plate to an automobile. 4,918,792, Cl. 24-300.000.

Engle, Thomas B. Pipe purging assembly and method therefor. 4,919,154, Cl. 134-22.120.

English, George J.: *See*—
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Enichem Tecnoresine S.p.A.: *See*—
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Environment/One Corporation: *See*—
Van Luik, Frank W., Jr.; and Cabahug, Eric F., 4,919,343, Cl. 241-36.000.

Environmental Products Corp.: *See*—
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Environmental Water Technology, Inc.: *See*—
Miller, Steven L., 4,919,301, Cl. 220-85.0S.
Miller, Steven L.; and Wathen, Ronald L., 4,919,375, Cl. 248-152.000.

Epstein, Howard, to Hewlett-Packard Company. Apparatus for producing a phase insensitive index pulse for motion encoders. 4,920,259, Cl. 250-237.130.

Erdberg, Adam. Inboard drive system for a marine craft. 4,919,630, Cl. 440-79.000.

Erdelitsch, Herbert: *See*—
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Ernst W. Dorn Co., Inc.: *See*—
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ESPE Stiftung & Co. Produktions - und Vertriebs KG: *See*—
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Etat Francais, represente par le ministres Delegue des Postes et Telecommunications (Centre National d'Etudes des Telecommunications): *See*—
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Eustache, Jacques: *See*—
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Evans, Gary A.; and Kirk, Jay B., to General Electric Company. Semiconductor radiation coupling system. 4,919,507, Cl. 350-96.190.

Evans, Samuel: *See*—
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Evans, Thomas L.; and Carpenter, John C., to General Electric Company. Method for making silicone-poly(arylcarbonate) block copolymers. 4,920,183, Cl. 525-464.000.

Eveready Battery Company, Inc.: *See*—
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Evert, Daniel D.: *See*—
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Ritter, Gerhard; Ritter, Klaus; and Stoisser, Gunther, 4,919,395, Cl. 266-103.000.

Excellente, Richard. Asymmetric insert loaded stringed instrument. 4,919,029, Cl. 84-291.000.

Extance, Philip; Hazelden, Roger J.; and Nutton, David, to Lucas Industries PLC. Combustion monitoring. 4,919,099, Cl. 123-425.000.

Exxon Research and Engineering Company: *See*—
Hamner, Glen P., deceased; Sawyer, Willard H.; and Boucher, Heather A., 4,919,786, Cl. 208-27.000.
Lipkin, Gregory M.; and Niedzwiecki, Joseph L., 4,919,794, Cl. 208-354.000.
Shulik, Larry J.; Sartori, Guido; Ho, W. S. Winston; Thaler, Warren; and Milliman, George E., 4,919,904, Cl. 423-225.000.
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Fabricacion De Maquinas, S.A.: *See*—
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Faherty, Vincent E.: *See*—
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Fantozzi, Louis R.; and Hopkins, James P., to Diversified Optical Corp. Fluid thermal compensation system. 4,919,519, Cl. 350-253.000.

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Far East Athletics Ltd.: *See*—
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Farmitalie Carlo Erba S.p.A.: *See*—
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Farng, Liehpao O.; and Horodysky, Andrew G., to Mobil Oil Corporation. Dithiocarbamate-derived phosphates as antioxidant/antiwear multifunctional additives. 4,919,830, Cl. 252-327.00E.

Farrar, James G., to International Navigation, Inc. Electronic digital compass. 4,918,824, Cl. 33-361.000.

Farrell, Michael E.: *See*—
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Fathy, Dariush: *See*—
Holland, Orin W.; Fathy, Dariush; and White, Clark W., 4,920,076, Cl. 437-238.000.

Faury, Christian: *See*—
Lesur, Pierre; Faury, Christian; Lafleur, Guy; and Papillon, Andre , 4,919,909, Cl. 423-360.000.

Faust, Paul A. Condenser. 4,918,943, Cl. 62-305.000.

Fay, Charles R.: *See*—
Binkley, Joseph H.; Caro, Perry A.; Dillon, John B.; Fay, Charles R.; Gibbons, Jonathan; Hooks, Hilary N.; Kadifa, Abdo G.; Lee, Jeffery W.; Lynch, William C.; Mock, Clayton W.; Neely, Everett T.; Tallan, Michael L.; Thompson, Geoffrey O.; Vukkadala, Gaya; Wick, John D.; and Woods, Donald R., 4,920,481, Cl. 364-200.000.

Federico, Joseph B.: *See*—
Consler, Donald; and Federico, Joseph B., 4,919,466, Cl. 294-170.000.

Fee, Kevin A.; and Hollinrake, Mark S., to Inter Innovation LeFebure Manufacturing Corp. Light-weight wall panel for protective enclosure. 4,918,900, Cl. 52-811.000.

Feingold, Vladimir; and Allworth, Peter C., to Bionica Pty. Limited. Infusion pump. 4,919,650, Cl. 604-67.000.

Feller, Wolfgang; Macht, Norbert; and Bottrich, Johannes G. Blood substitute. 4,920,194, Cl. 530-385.000.

Ferrari, Patrizia: *See*—
Chiodini, Laura; Gobbini, Mauro; Mantegani, Sergio; Ruggieri, Daniela; Temperilli, Aldemio; Traquandi, Gabriella; and Ferrari, Patrizia, 4,920,099, Cl. 514-26.000.

Ferrer, Enrique: *See*—
Clark, Edward T.; and Ferrer, Enrique, 4,920,285, Cl. 307-571.000.

Fessel, Manfred; and Trinkl, Gerd, to Foseco International Limited. Mould and process for the production of nodular or compacted graphite iron castings. 4,919,188, Cl. 164-58.100.

FEV Motorentechnik GmbH & Co. KG: *See*—
Pischinger, Franz; Spicher, Ulrich; and Heuser, Georg, 4,918,982, Cl. 73-116.000.

Fiat Auto S.p.A.: *See*—
Rana, Avtar Singh; and Gandiglio, Romolo, 4,919,226, Cl. 180-274.000.

Fiberglass Technologies, Inc.: *See*—
Rutledge, Woodrow T., Jr.; Rutledge, Russell P.; Jones, T. Mike; McCown, Don E.; and Hodnett, J. Tom, 4,919,560, Cl. 403-268.000.

Figgie International Inc.: *See*—
Morgan, Steven J.; and Martin, Gary L., 4,919,255, Cl. 198-781.000.

Filley, Oliver D. Physical inventory system. 4,920,488, Cl. 364-403.000.

Fimian, Brian P.: *See*—
Fimian, Keith S.; McGreevy, John E.; Fimian, Brian P.; and Tucker, Richard W., 4,920,263, Cl. 250-255.000.

Fimian, Keith S.; McGreevy, John E.; Fimian, Brian P.; and Tucker, Richard W., to Gemini Research, Inc. Radon detection system. 4,920,263, Cl. 250-255.000.

Fineblum, Solomon S. Hybrid thermal powered and engine powered automobile air conditioning system. 4,918,937, Cl. 62-175.000.

Fink, Hans-Werner; Morin, Roger; Schmid, Heinz; and Stocker, Werner, to international Business Machines Corporation. Method of making self-aligned apertures. 4,919,780, Cl. 204-192.340.

Fink, Roy G.: *See*—
Millar, Edward A.; Harris, Gerald F.; and Fink, Roy G., 4,919,672, Cl. 623-22.000.

Fintel, William A., to Du Pont de Nemours, E. I., and Company. Process for metering color concentrates to thermoplastic polymer melts. 4,919,872, Cl. 264-103.000.

Firestone, Bruce M.: *See*—
Kosik, Joseph F., Sr.; and Firestone, Bruce M., 4,919,331, Cl. 239-2.200.

First Medic: *See*—
Vandehey, Marvin E., 4,919,144, Cl. 128-705.000.

Firth, Charles B. Mine clearing apparatus. 4,919,034, Cl. 89-1.130.

Fischer, Betram: *See*—
Maier, Gerhard; and Fischer, Betram, 4,920,455, Cl. 361-424.000.

Fischer, Ronald H.; LaPierre, Rene B.; Owens, Peter J.; and Varghese, Philip, to Mobil Oil Corp. Production of high octane gasoline. 4,919,789, Cl. 208-61.000.

Fisher Scientific Company: *See*—
Meijer, Robert S., 4,920,336, Cl. 340-619.000.

Fitzgibbon, Daniel F., Jr. Methods and apparatus for field blasting of earth formations using inflatable devices for suspending explosives in bore holes. 4,919,203, Cl. 166-187.000.

Flachglas Aktiengesellschaft: *See*—
Kallinich, Dietmar; Hahlert, Wolfgang; and Thom, Peter, 4,919,170, Cl. 138-39.000.

Flaherty, Bruce W., to McDonnell Douglas Corporation. Wavelength shift switch and sensing system. 4,919,512, Cl. 350-96.290.

Flament, Gerard, to Charbonnages de France. Fluid fuel combustion process and turbulent-flow burner for implementing same. 4,919,611, Cl. 431-350.000.

Flamig, Hans: *See*—
Schiel, Christian; Flamig, Hans; and Schutte, Andreas, 4,919,761, Cl. 162-358.000.

Fleischmann, Lewis W., to Leonard Bloom, a part interest. Model submarine. 4,919,637, Cl. 446-162.000.

Fletcher, Joel A.: *See*—
Barr, Robert; and Fletcher, Joel A., 4,920,333, Cl. 340-545.000.

Flo-Con Systems, Inc.: *See*—
King, Patrick D., 4,919,397, Cl. 266-267.000.

Flotow, Richard A., to Dana Corporation. Clutch brake having segmented cover surfaces. 4,919,243, Cl. 192-18.00R.

FMC Corporation: *See*—
Maravetz, Lester L., 4,919,708, Cl. 71-92.000.

Focke & Co. (GmbH & Co.): *See*—
Focke, Heinz; and Granz, Helmut, 4,918,908, Cl. 53-579.000.

Focke, Heinz; and Granz, Helmut, to Focke & Co. (GmbH & Co.). Apparatus for feeding blanks to a folding turret of a packaging machine. 4,918,908, Cl. 53-579.000.

Fogal, Robert D., Sr., to International Marketing, Inc. Method of inspecting tires for defects. 4,918,976, Cl. 73-40.700.

Foley, Susan F.: *See*—
Edmunds, Timothy; and Foley, Susan F., 4,920,051, Cl. 435-215.000.

Fong, Dodd W.; Hoots, John E.; Johnson, Donald A.; and Kneller, James, to Nalco Chemical Company. Modified maleic anhydride polymers and the like for use as scale inhibitors. 4,919,821, Cl. 210-698.000.

Force, George H., to Ernst W. Dorn Co., Inc. Crush roller assembly for a screen process printing machine. 4,919,554, Cl. 400-419.000.

Ford Aerospace Corporation: *See*—
Chudy, John S.; Kniffin, M. John; and McNeil, D. Yvonne, 4,918,929, Cl. 62-51.100.

Ford, Bacon & Davis Incorporated: *See*—
Taggart, George W.; Denk, Lawrence T.; and Lawrence, J. Michael, 4,919,912, Cl. 423-574.00R.

Ford, John W.; and Dyer, Maurice J. Contactless web support guide. 4,919,319, Cl. 226-197.000.

Ford Motor Company: *See*—
Bolz, Ralph C., 4,919,012, Cl. 74-866.000.
Fuss, Josef; and Adams, Gerd, 4,919,643, Cl. 474-46.000.
Gandhi, Haren S.; and Su, Eugene C., 4,919,903, Cl. 423-213.500.
McCune, Robert C.; and Baird, Ronald J., 4,919,974, Cl. 427-249.000.

Ford New Holland, Inc.: *See*—
Sheehan, Ronald T.; Seymour, Shaun A.; Chow, Mark K.; and Strosser, Richard P., 4,918,910, Cl. 56-341.000.

Forman, Donald B., to United States of America, Navy. Multi-post yoke gimbal. 4,919,382, Cl. 248-178.000.

Forrest, Robin J.; and Ward, Russell C., to Ceiling Doctor International Inc. Method and apparatus for cleaning the interior surfaces of buildings, and especially ceilings of office buildings. 4,919,159, Cl. 134-22.180.

Forsberg, Gunnar S.; and Josefsson, Stefan E., to Telefonaktiebolaget L M Ericsson. Method and apparatus for transmitting a synchronous data signal on a transmission medium on which the transmission rate is greater than the data signal bit rate. 4,920,545, Cl. 375-58.000.

Forsberg, John W.: *See*—
Riga, Alan T.; and Forsberg, John W., 4,919,178, Cl. 149-2.000.

Fortec, Inc.: *See*—
Olson, John B.; Jeanson, Richard L.; and Sinchok, John D., 4,919,250, Cl. 194-248.000.

Fortune, William S.; and Dallons, Robert E. Desoldering tip and replacement apparatus. 4,919,322, Cl. 228-20.000.

Foseco International Limited: *See*—
Fessel, Manfred; and Trinkl, Gerd, 4,919,188, Cl. 164-58.100.

Foshee, William R., to Best Lock Corporation. High security padlock. 4,918,950, Cl. 70-38.00A.

Fossum, Eric R.; Kirchner, Peter D.; Pettit, George D.; Warren, Alan C.; and Woodall, Jerry M., to International Business Machines Corporation. Submicron dimension compound semiconductor fabrication using thermal etching. 4,920,069, Cl. 437-90.000.

Foster, Cark B.: *See*—
Haber, Terry M.; and Foster, Cark B., 4,919,657, Cl. 604-232.000.

Fotland, Richard A.; Grosclaude, Gary V.; and Briere, Richard L., decesased, to Dennison Manufacturing Company. Multiple imaging. 4,920,039, Cl. 430-324.000.

Fowler, Kenneth A.; Patch, Dana R.; and Hotchkiss, Frederick H., to Panametrics, Inc. Ultrasonic transducer assembly. 4,918,990, Cl. 73-629.000.

Fox, Charles: *See*—
Gershon, Sol; Fox, Charles; and Garfinkle, Norton, 4,919,433, Cl. 273-192.000.

Fraissenet, Bruno: *See*—
Cartry, Jean P.; and Fraissenet, Bruno, 4,918,808, Cl. 29-727.000.

Framatome: *See*—
Cartry, Jean P.; and Fraissenet, Bruno, 4,918,808, Cl. 29-727.000.
Chotard, Alain, 4,919,884, Cl. 376-419.000.

Francillon, Marie-Jo: *See*—
Ambier, Jean; Francillon, Marie-Jo; Allibert, Colette; and Laugee, Catherine, 4,919,717, Cl. 75-228.000.

Frankenberg, Wolfgang; Laber, Hans; and Weschta, Alois, to Siemens Aktiengesellschaft. Method and arrangement to commutate the current between turn-off valve arms of an I-type static converter. 4,920,473, Cl. 363-96.000.

Franklin Electric Co., Inc.: *See*—
Schaefer, Edward J., 4,918,802, Cl. 29-598.000.

Franklin, Robert P.: *See*—
Benjamin, Olivier; Franklin, Robert P.; and Larocca, John, 4,919,383, Cl. 248-349.000.

Franks, Joseph K., to Jensen Engineering. Pliers for closing a locking ring. 4,919,021, Cl. 81-426.500.

Freeman, D. C.; and Djabbarah, N. F., to Mobil Oil Corporation. Method for preventing bitumen backflow in injection wells when steam injection is interrupted. 4,919,206, Cl. 166-252.000.

Freeport McMoRan Inc.: *See*—
Smith, Jay C.; McCord, Thomas H.; and O'Neil, Gregory R., 4,919,715, Cl. 75-423.000.

Frejborg, Frey A., to A. Ahlstrom Corporation. Screen and method of manufacture. 4,918,807, Cl. 29-163.800.

Fremin, Kit C. Thermochromatic infant feeding container. 4,919,983, Cl. 428-35.700.

Fresch, Vincent P.; Mathews, Titus; and Rossi, Anthony R., to Pneumatech, Inc. Self-contained air drying unit. 4,918,939, Cl. 62-272.000.

Frey, Otto: *See*—
Stubmer, Karl-Gerhart; Koch, Rudolf; and Frey, Otto, 4,919,677, Cl. 623-22.000.

Friedman, Robert B., to American Maize-Products Company. Process for producing modified cyclodextrins. 4,920,214, Cl. 536-103.000.

Friend, Robert C.; and Patton, Charles R., III, to Western Digital Corp. Switchable bus termination and address selector. 4,920,339, Cl. 340-825.520.

Friman, Alf, to Carmis Enterprises S.A. Arrangement for decoupling integrated circuits electrically. 4,920,444, Cl. 361-56.000.

Frisinger, Bruce L.: *See*—
Zeigler, Henry J.; and Frisinger, Bruce L., 4,919,578, Cl. 411-113.000.

Frito-Lay, Inc.: *See*—
Barry, David L.; Dreher, Mark L.; Johnson, Alan A.; and Schroeder, Otto E., 4,919,947, Cl. 426-94.000.
Kreager, William D., Jr., 4,919,740, Cl. 156-203.000.

Fritsch, Walter; and Megerle, Friedrich, to Klockner-Humboldt-Deutz Aktiengesellschaft. Apparatus for smelting meltable substances, particularly ore concentrates. 4,919,396, Cl. 266-182.000.

Fritzsche, Harold L., to General Electric Company. Apparatus and method for forming edgewise wound cores. 4,918,962, Cl. 72-134.000.

Froes, Francis H.: *See*—
Venkataraman, Ganapathy; and Froes, Francis H., 4,919,886, Cl. 420-420.000.

Frye, Lester C.: *See*—
Bucher, George D.; DiGrande, John T.; Frye, Lester C.; and Stoutamire, Mark S., 4,918,991, Cl. 73-864.000.

Fuerthbauer, Rupert; and Bruhin, Rolf. Light filter with atuomatic regulation of optical transmission. 4,920,257, Cl. 250-201.100.

Fuji Electric Co., Ltd.: *See*—
Itoh, Shinichi; and Shigekane, Hisao, 4,920,405, Cl. 357-74.000.
Nishiura, Masaharu, 4,920,392, Cl. 357-23.700.

Fuji Jukogyo Kabushiki Kaisha: *See*—
Gomi, Hideshige; Matsumoto, Shoichi; and Yamazaki, Harugi, 4,919,095, Cl. 123-328.000.
Nakamura, Mitsuo, 4,919,100, Cl. 123-492.000.

Fuji Kogyo Kabushiki Kaisya: *See*—
Nakagawa, Kiyoshi, 4,919,356, Cl. 242-199.000.

Fuji Photo Film Co., Ltd.: *See*—
Arai, Fuminori; and Osada, Fusae, 4,919,890, Cl. 422-56.000.
Hayashi, Katsumi, 4,920,035, Cl. 430-267.000.
Inoue, Nobuaki; Sasaoka, Senzo; Inagaki, Yoshio; Kojima, Tetsuro; and Yagihara, Morio, 4,920,029, Cl. 430-264.000.
Iwakura, Ken; Sano, Shojiro; Satomura, Masato; Ito, Koreshige; and Matsuoka, Katsumi, 4,920,091, Cl. 503-211.000.
Kakimi, Fujio, 4,920,027, Cl. 430-138.000.
Kaneko, Kiyotaka, 4,920,371, Cl. 354-410.000.
Masuda, Toshiyuki, 4,919,988, Cl. 428-64.000.
Minato, Shinichiro; and Nishino, Atsuo, 4,919,774, Cl. 204-129.400.
Miyakawa, Tadashi, 4,920,411, Cl. 358-80.000.
Nagata, Takehumi; and Kimura, Tsutomu, 4,920,267, Cl. 250-327.200.

Ohki, Nobutaka; Andoh, Kazuto; and Ishikawa, Takatoshi, 4,920,041, Cl. 430-380.000.
Ohno, Shigeru; Inagaki, Yoshio; Adachi, Keiichi; and Momoki, Yasuhito, 4,920,031, Cl. 430-522.000.
Oishi, Kengo; and Suzuki, Osamu, 4,919,873, Cl. 264-130.000.
Sasaoka, Senzo; and Inoue, Nobuaki, 4,920,034, Cl. 430-264.000.
Shiota, Kazuo, 4,920,423, Cl. 358-335.000.
Totsuka, Mikio; Shinozaki, Fumiaki; Wakata, Yuichi; and Namiki, Tomizo, 4,920,036, Cl. 430-270.000.
Toya, Ichizo; and Yoneyama, Masakazu, 4,920,032, Cl. 430-536.000.
Waki, Kokichi; Asami, Masahiro; and Shibata, Yoshinori, 4,920,042, Cl. 430-380.000.
Yoshino, Tatsuo, 4,920,252, Cl. 219-497.000.

Fujii, Satoru; Tanaka, Hiroaki; Furukawa, Takeshi; Muraoka, Masaaki; Narishima, Ryosuke; and Tamashige, Takamiki, to Onoda Cement Company, Ltd. Leakage prevention apparatus for a classifier. 4,919,795, Cl. 209-135.000.

Fujiki, Akira: *See*—
Abe, Makoto; Tanimoto, Ichiro; Fujiki, Akira; Suzuki, Keitaro; Endo, Hiroyuki; and Ikenoue, Yutaka, 4,919,719, Cl. 75-243.000.

Fujikoshi Machinery Corporation: *See*—
Kitta, Satoru, 4,918,869, Cl. 51-131.100.

Fujikura Ltd.: *See*—
Makiyo, Minoru; Goto, Shigenori; Yokosuka, Hiroshi; Curtis, Robert L.; and Wade, Philip J., 4,920,236, Cl. 174-77.00R.

Fujimoto, Ted T., to Rohm and Haas Company. Alpha-alkyl-alpha-(4-halophenyl)-1H-1,2,4-triazole-1-propanenitrile. 4,920,139, Cl. 514-383.000.

Fujisawa Pharmaceutical Company, Ltd.: *See*—
Shiokawa, Youichi; Nagano, Masanobu; and Itani, Hiromichi, 4,920,129, Cl. 514-300.000.

Fujita, Kenjiro: *See*—
Hiramatsu, Takeo; Fujita, Kenjiro; Nagayoshi, Yoshimasa; Hirakushi, Shuzo; and Hamasaki, Yoshiaki, 4,919,248, Cl. 192-61.000.

Fujita, Senji: *See*—
Sugiura, Saburo; Fujita, Senji; Nakata, Hiroya; Okamoto, Tetsuo; Inagaki, Yoshio; Mizuguchi, Keiichi; and Ishii, Atsushi, 4,919,714, Cl. 75-529.000.

Fujitsu Kasei Ltd.: *See*—
Kimura, Takashi; Chihara, Kenichi; Tomatsu, Masahiro; Inoue, Kazunobu; Yano, Norio; and Adachi, Osamu, 4,920,441, Cl. 360-133.000.

Fujitsu Limited: *See*—
Endo, Seiji; Kobayashi, Osamu; and Kamimura, Masatsugu, 4,920,544, Cl. 375-26.000.
Hatori, Yoshinori; Koga, Toshio; Matsuda, Kiichi; and Mukawa, Naoki, 4,920,426, Cl. 358-433.000.
Iguchi, Kazuo; Soejima, Tetsuo; Murano, Kazuo; Amemiya, Shigeo; Komine, Hiroaki; Watanabe, Toshiaki; and Shinomiya, Tomohiro, 4,920,546, Cl. 375-106.000.
Isono, Osamu; Nishino, Tetsuo; and Iwabuchi, Eisuke, 4,920,531, Cl. 370-60.000.
Kimura, Takashi; Chihara, Kenichi; Tomatsu, Masahiro; Inoue, Kazunobu; Yano, Norio; and Adachi, Osamu, 4,920,441, Cl. 360-133.000.
Mukai, Ryoichi, 4,920,070, Cl. 437-173.000.
Tsuchimoto, Yuji, 4,920,516, Cl. 365-203.000.
Watanabe, Toshiaki; Iguchi, Kazuo; Soejima, Tetsuo; and Obta, Shinji, 4,920,535, Cl. 370-105.100.
Watanabe, Yoshio; and Emori, Shinji, 4,920,406, Cl. 357-74.000.
Yamamoto, Haruhiko; Suzuki, Masahiro; Udagawa, Yoshiaki; Nakata, Mitsuhiko; Katsuyama, Koji; Ono, Izumi; and Kikuchi, Shunichi, 4,920,574, Cl. 361-385.000.

Fujitsu, Tadashi: *See*—
Sawada, Hachiro; Fujitsu, Tadashi; Takahashi, Ken-ichi; and Honma, Hideaki, 4,920,504, Cl. 364-521.000.

Fujiwara, Teruaki: *See*—
Irie, Yoshio; Iwasaki, Kaoru; Hatsuda, Takumi; Kimura, Kazumasa; Harada, Nobuyuki; Ishizaki, Kunihiko; Shimomura, Tadao; and Fujiwara, Teruaki, 4,920,202, Cl. 528-500.000.

Fujiyoshi, Yoshihiro; Nagase, Hidenobu; Fukuo, Koichi; and Aoki, Takatoshi, to Honda Giken Kogyo Kabushiki Kaisha. Valve operating system for internal combustion engine. 4,919,089, Cl. 123-90.160.

Fukumochi, Etsuko: *See*—
Fukumochi, Keisuke; Fukumochi, Etsuko; Fukumochi, Nobumoto; Fukumochi, Naotoshi; and Fukumochi, Kazumasa, 4,919,424, Cl. 273-164.000.

Fukumochi, Kazumasa: *See*—
Fukumochi, Keisuke; Fukumochi, Etsuko; Fukumochi, Nobumoto; Fukumochi, Naotoshi; and Fukumochi, Kazumasa, 4,919,424, Cl. 273-164.000.

Fukumochi, Keisuke; Fukumochi, Etsuko; Fukumochi, Nobumoto; Fukumochi, Naotoshi; and Fukumochi, Kazumasa. Golf putter. 4,919,424, Cl. 273-164.000.

Fukumochi, Naotoshi: *See*—
Fukumochi, Keisuke; Fukumochi, Etsuko; Fukumochi, Nobumoto; Fukumochi, Naotoshi; and Fukumochi, Kazumasa, 4,919,424, Cl. 273-164.000.

Fukumochi, Nobumoto: *See*—
Fukumochi, Keisuke; Fukumochi, Etsuko; Fukumochi, Nobumoto; Fukumochi, Naotoshi; and Fukumochi, Kazumasa, 4,919,424, Cl. 273-164.000.

Fukumoto, Hiroshi: *See*—
Arahara, Kohzoh; Fukumoto, Hiroshi; Yuasa, Toshiya; Ohnishi, Toshikazu; Kan, Fumitaka, deceased; Tanioka, Hiroshi; Koizumi, Norihiko; and Tohyama, Noboru, 4,920,361, Cl. 346-140.00R.

Fukumoto, Masaki: *See*—
Fuse, Genshu; Yamada, Toshio; Odanaka, Shinji; and Fukumoto, Masaki, 4,920,390, Cl. 357-23.600.

Fukunaga, Takahiro: *See*—
Nakanishi, Yasushi; Fukunaga, Takahiro; and Matsumoto, Manabu, 4,920,379, Cl. 355-210.000.

Fukuo, Koichi: *See*—
Fujiyoshi, Yoshihiro; Nagase, Hidenobu; Fukuo, Koichi; and Aoki, Takatoshi, 4,919,089, Cl. 123-90.160.

Fukuta, Kenji; Kaneko, Takaoki; and Takahashi, Yoshinobu, to Toyota Jidosha Kabushiki Kaisha. Apparatus and method for plasma treatment of resin material. 4,919,745, Cl. 156-345.000.

Fukuzumi, Katsuhiko: *See*—
Kyoya, Michio; and Fukuzumi, Katsuhiko, 4,918,924, Cl. 60-602.000.

Fuller, John; and Regan, Michael C., to Reed Tool Company, Ltd. Cutting structures for steel bodied rotary drill bits. 4,919,220, Cl. 175-329.000.

Funabashi, Motohisa: *See*—
Shimada, Kousaku; Sekozawa, Teruji; and Funabashi, Motohisa, 4,919,098, Cl. 123-422.000.

Funk, Murrell N., to Texas Aluminum Industries, Inc. Glazing retainer assembly. 4,918,882, Cl. 52-86.000.

Furukawa, Masami: *See*—
Yoneda, Yousuke; and Furukawa, Masami, 4,919,052, Cl. 104-54.000.

Furukawa, Masatoshi; and Kobayshi, Kazuo, to Alps Electric Co., Ltd. Magnetic head unit and method of manufacturing the same. 4,920,438, Cl. 360-104.000.

Furukawa, Takeshi: *See*—
Fujii, Satoru; Tanaka, Hiroaki; Furukawa, Takeshi; Muraoka, Masaaki; Narishima, Ryosuke; and Tamashige, Takamiki, 4,919,795, Cl. 209-135.000.

Furuya, Akihiko; Kanamaru, Kouiti; and Inoue, Junichi, to Kabushiki Kaisha Toshiba; and Toshiba Computer Engineering Corporation. Cache system used in a magnetic disk controller adopting an LRU system. 4,920,478, Cl. 364-200.000.

Furuya, Masato: *See*—
Takanashi, Itsuo; Nakagaki, Shintaro; Shinonaga, Hirohiko; Asakura, Tsutou; and Furuya, Masato, 4,920,417, Cl. 358-209.000.

Fuse, Genshu; Yamada, Toshio; Odanaka, Shinji; and Fukumoto, Masaki, to Matsushita Electric Industrial Co., Ltd. Semiconductor memory device and method of fabricating the same. 4,920,390, Cl. 357-23.600.

Fushimi, Fumiyoshi: *See*—
Yamamoto, Takuya; Fushimi, Fumiyoshi; and Nishikido, Jyoji, 4,919,809, Cl. 210-500.230.

Fusa, Josef; and Adams, Gerd, to Ford Motor Company. Device for setting a gear ratio in a continually variable belt-drive transmission. 4,919,643, Cl. 474-46.000.

Futch, Max G.; and Drushel, Ronald H., to Futch, Max G. Self leveling dispenser. 4,919,275, Cl. 211-1.500.

G. D. Societa per Azoni: *See*—
Gamberini, Antonio; and Minarelli, Alessandro, 4,918,901, Cl. 53-234.000.

G & W Electric Co.: *See*—
Pflanz, Herbert M., 4,920,446, Cl. 361-93.000.

Gabbay, Emile; and Le Guen, Jacques, to General Electric CGR SA. Compact type X-ray emitter. 4,920,554, Cl. 378-200.000.

Gabeler, Stephen C., to Stephen C. Gabeler. Automatic incremental focusing scanner system. 4,920,255, Cl. 235-454.000.

Gabizon, Alberto: *See*—
Allen, Theresa M.; and Gabizon, Alberto, 4,920,016, Cl. 424-450.000.

Gachet, Benton W.; Hunstman, Dennis C.; Popik, Matthew G.; and Taylor, Robert W., to Porter Cable Corporation. Ramped device for finite positioning of panel joint forming tool. 4,919,176, Cl. 144-134.00D.

Gadkaree, Kishor P., to Corning Incorporated. Hybrid ceramic matrix composite articles comprising particulate additives and method. 4,919,991, Cl. 428-113.000.

GAF Chemical Corporation: *See*—
Cho, James R.; Smith, Terry E.; and Cottrell, Ian W., 4,920,145, Cl. 514-420.000.

Gahan, John K.: *See*—
Anderson, Ernest R.; and Gahan, John K., 4,918,759, Cl. 2-199.000.

Galemmo, Robert A., Jr.: *See*—
Huang, Fu-chi; Galemmo, Robert A., Jr.; and Campbell, Henry F., 4,920,130, Cl. 514-311.000.
Huang, Fu-Chi; Galemmo, Robert A., Jr.; and Campbell, Henry F., 4,920,131, Cl. 514-311.000.
Huang, Fu-chi; Galemmo, Robert A., Jr.; and Campbell, Henry F., 4,920,132, Cl. 514-314.000.
Huang, Fu-chi; Galemmo, Robert A., Jr.; and Campbell, Henry F., 4,920,133, Cl. 514-314.000.

Gallagher, Kevin P.: *See*—
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Gamberini, Antonio; and Minarelli, Alessandro, to G. D. Societa per Azoni. Device for the infeed of discrete strips of tin foil in cigarette packaging machinery. 4,918,901, Cl. 53-234.000.

Gammill, Charles E.: *See*—
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Gammill, Jerry D.: *See*—
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Gandhi, Haren S.; and Su, Eugene C., to Ford Motor Company. Method of catalytically oxidizing methanol vapor accompanied by little or no excess oxygen. 4,919,903, Cl. 423-213.500.
Gandiglio, Romolo: *See*—
Rana, Avtar Singh; and Gandiglio, Romolo, 4,919,226, Cl. 180-274.000.
Gandini, Luigi, to American Standard Inc. Flush tank for a water closet having self contained washing means. 4,918,769, Cl. 4-661.000.
Ganster, Otto: *See*—
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Garabedian, Edward A. Multiple positionable chair construction. 4,919,481, Cl. 297-258.000.
Garber, Eduard A.: *See*—
Lipukhim, Jury V.; Danilov, Leonid I.; Garber, Eduard A.; and Subbotin, Anatoly N., 4,918,960, Cl. 72-40.000.
Garcia, Eduardo C.: *See*—
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Gardella, Peter; and Wood, Kevin L., to Norcal Solid Waste Systems, Inc. Compacted bale. 4,919,979, Cl. 428-2.000.
GardenAmerica Corporation: *See*—
Van Leeuwen, Timothy O.; and Hobbs, Billy J., Jr., 4,919,337, Cl. 239-205.000.
Garfinkle, Norton: *See*—
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Garnweidner, Peter: *See*—
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Gartside, Robert J.; and Norton, Richard C., to Stone & Webster Engineering Corp. Particulate solids cracking apparatus. 4,919,898, Cl. 422-219.000.
Garwood, William E.: *See*—
Chen, Nai Y.; Garwood, William E.; Huang, Tracy J.; Le, Quang N.; and Wong, Stephen S., 4,919,788, Cl. 208-59.000.
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Sarkisian, Paul H.; and Becker, Frederick E., 4,919,609, Cl. 431-7.000.
Gates, Richard S.; and Hsu, Stephen M., to United States of America, Commerce. Aluminum hydroxides as solid lubricants. 4,919,829, Cl. 252-25.000.
Gatti, Giancarlo, to Bull HN Information Systems Italia S.p.A. Dry toner removable developing cartridge. 4,919,071, Cl. 118-653.000.
Gaudet, Peter W.; Olsen, Donald A.; Eacobacci, Michael J.; Harvell, John T.; Lepofsky, Robert J.; Roche, David E.; and Bender, Steven A., to Helix Technology Corporation. Electronically controlled cryopump. 4,918,930, Cl. 62-55.500.
Gaussa, Louis W., Jr.; Graham, Kingsley F.; Lipchak, John B.; and Greenberg, Lesley, to Westinghouse Elecric Corp. Source range neutron flux count rate system incorporating method and apparatus for eliminating noise from pulse signal. 4,920,548, Cl. 376-255.000.
Gavrilos, Andrew D.: *See*—
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Gay, Christian; and Lassiaz, Philippe, to Valeo. Assembly of two generally annular members, in particular a diaphragm and securing member for a clutch mechanism, particularly for an automobile. 4,919,246, Cl. 192-89.00B.
Gearin, Peter: *See*—
Bates, H. John; Achterman, Kermit L.; Gearin, Peter; and Halpin, Terence, 4,919,582, Cl. 414-233.000.
Gebhardt, Elfriede, to Gebhardt Fordertechnik GmbH. Loading roller conveyor with drive via intermediate rollers. 4,919,256, Cl. 198-781.000.
Gebhardt Fordertechnik GmbH: *See*—
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GEC-Marconi Limited: *See*—
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Gehret, Jean-Claude, to Ciba-Geigy Corporation. Insecticides and parasiticides. 4,920,148, Cl. 514-450.000.
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Gembarosky, Michael P.; Clark, Gary S.; Baybrook, Howard E.; and Trudgeon, Arthur E., to Allegheny Ludlum Corporation. Protector for "C" hooks. 4,919,465, Cl. 294-67.200.
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Genentech, Inc.: *See*—
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General Director of the Agency of Industrial Science and Technology: *See*—
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General Electric CGR SA: *See*—
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General Electric Company: *See*—
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Allen, Richard B.; Gibbs, William E.; and Hans, Lynn M., 4,920,153, Cl. 521-60.000.
Brunelle, Daniel J.; and Bonauto, David K., 4,920,200, Cl. 528-370.000.
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Fritzsche, Harold L., 4,918,962, Cl. 72-134.000.
Gnaver, Ivar; and Keese, Charles R., 4,920,047, Cl. 435-7.000.
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Poling, Ronald W., 4,920,240, Cl. 200-83.00P.
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General Foods Corporation: *See*—
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Liszka, Kenneth J.; Dobruse, Daniel J.; Potopa, Steve E.; Gammill, Charles E.; and Gammill, Jerry D., 4,918,805, Cl. 29-888.060.
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Toms, Geoffrey S., 4,919,449, Cl. 280-688.000.
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Genger, Richard D.: *See*—
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Geo-Centers, Inc.: *See*—
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Geostock S.A.R.L. and ESYS S.A.: *See*—
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Ger, Ralph. Method of closing the opening of a hernial sac. 4,919,152, Cl. 128-898.000.
Gerber, Milton, to Advanced Fiber Technology, Inc. Method and apparatus for fiberizing and cellulosic product thereof. 4,919,340, Cl. 241-5.000.
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Gershon, Sol; Fox, Charles; and Garfinkle, Norton. Golf putting trainer. 4,919,433, Cl. 273-192.000.
Gerszewski, Mark, to U.M.C., Inc. Precast concrete foundation elements and system and method of using same. 4,918,891, Cl. 52-295.000.
Gery, Daniel E.; and Meunier, Philippe, to Societe Anonyme Dite Hispano Suiza. Method of putting a tool-carrying robot into position in a containment vessel. 4,919,194, Cl. 165-1.000.
Gesellschaft fur Strahlenund Umweltforschung mbH: *See*—
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Giaever, Ivar; and Keese, Charles R., to General Electric Company. Electrical detection of the immune reaction. 4,920,047, Cl. 435-7.000.
Gibbons, Jonathan: *See*—
Binkley, Joseph H.; Caro, Perry A.; Dillon, John B.; Fay, Charles R.; Gibbons, Jonathan; Hooks, Hilary N.; Kadifa, Abdo G.; Lee, Jeffery W.; Lynch, William C.; Mock, Clayton W.; Neely, Everett T.; Tallan, Michael L.; Thompson, Geoffrey O.; Vukkadala, Gaya; Wick, John D.; and Woods, Donald R., 4,920,481, Cl. 364-200.000.
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Gibney, John. Autogeneous pumping chamber and procedures therefor. 4,919,661, Cl. 623-3.000.
Gidda, Jaswant S.; Kirst, Herbert A.; and Robertson, David W., to Eli Lilly and Company. Method for treating gastrointestinal disorders. 4,920,102, Cl. 514-28.000.
Giebeler, Robert, to Beckman Instruments Inc. UV scanning system for centrifuge. 4,919,537, Cl. 356-328.000.
Gilardi, Pier E., to Gestioni Riunite Toscana Gomma S.p.A. Process and apparatus for marking articles of foam material when produced irregularly. 4,919,862, Cl. 264-40.100.
Gilbert, John A.: *See*—
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Giniecki, Troy A.: *See*—
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Glasse-Davies, Wayne: *See*—
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Glazer, Edward A., to Pfizer Inc. Quinazolin-4(3H)-one derivatives as anticoccidial agents. 4,920,224, Cl. 544-284.000.
Glomb, Reiner; and Fangmeier, Ralf, to Kieserling & Albrecht GmbH & Co. Device for bending conical wires. 4,918,958, Cl. 72-10.000.
Glomski, Stanislas; and Roseberry, Patrick. Heat exchanger wall assembly. 4,919,200, Cl. 165-166.000.
Gluck, Bruno A. Antiseptic cleansing composition comprising a water-soluble salt of chlorhexidine. 4,919,837, Cl. 252-106.000.
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Gobel, Ewald; Maurer, Dieter; and Opitz, Rigobert, to IBP Pietzach GmbH. Method of and a device for safeguarding a vehicle or machinery movable in space. 4,920,520, Cl. 367-99.000.
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Goetz, Kurt A. Universal clamping fixture for baby carriage umbrellas. 4,919,379, Cl. 248-231.600.
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Golwyn, Daniel H. Treatment of neurotransmitter-linked drug abuse. 4,919,916, Cl. 424-10.000.
Gomi, Hideshige; Matsumoto, Shoichi; and Yamazaki, Harugi, to Fuji Jukogyo Kabushiki Kaisha. Dashpot for an internal combustion engine. 4,919,095, Cl. 123-328.000.
Gongwer, Calvin A., to Allied-Signal, Inc. Hydrodynamic configuration for underwater vehicle. 4,919,066, Cl. 114-338.000.
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Goodyear Tire & Rubber Company, The: *See*—
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Gore, Robert W., to W. L. Gore & Associates, Inc. Method for measuring moisture vapor transmission rate in wearing apparel. 4,918,981, Cl. 73-76.000.
Goscenski, Edward J., Jr., to Eaton Corporation. Differential smart clutch with gear reaction. 4,919,008, Cl. 475-234.000.
Goshi Kaisha Yagishita: *See*—
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Gottlieb, A. Arthur; Sizemore, Robert C.; and Sinha, Sudhir K., to Imreg, Inc. Immunosuppressor and method of extraction thereof from leukocytes. 4,920,097, Cl. 514-2.000.
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Gove, Larry K.: *See*—
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den Heijer, Ronald; Goverde, Godefridus C.; and Simons, Peter G. M., 4,920,288, Cl. 310-15.000.
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Gradeff, Peter S.; Schreiber, Fred G.; Grosbois, Jean; and Mauermann, Heiko, to Rhone-Poulenc Inc. Ceric hydrocarbyloxy nitrates and their use in organic synthesis. 4,920,204, Cl. 534-15.000.
Graff, Roderich W. Device for generating a continuous stream of dried gases. 4,918,837, Cl. 34-80.000.
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Grant, Michael L. Intravenous catheter shield and retainer. 4,919,150, Cl. 128-877.000.
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Grau, Gerhard; and Derichs, Josef, to Zinser Textilmaschinen GmbH. Spinning apparatus. 4,918,911, Cl. 57-100.000.
Grauberger, Gerald D. Fishing rod holder. 4,919,316, Cl. 224-42.420.
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Great Plains Industries, Inc.: *See*—
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Green, David J., to United States of America, National Aeronautics and Space Administration. Lightweight ceramic insulation and method. 4,919,852, Cl. 264-6.000.
Green, James R., to Du Pont de Nemours, E. I., and Company. Blend of cotton, nylon and heat-resistant fibers. 4,920,000, Cl. 428-288.000.
Green, Marion C. Means and method for detecting leaks in tanks. 4,918,978, Cl. 73-49.200.
Green, Thomas F. Leverage lifting cart. 4,919,442, Cl. 280-43.100.

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Grendahl, Dennis T. Laminated zone of focus artificial hydrogel lens. 4,919,663, Cl. 623-6.000.
Gresens, Harry, to Bruckner Trochentechnik GmbH & Co. KG. Tensioning machine. 4,918,796, Cl. 26-94.000.
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Grilliot, William L.; and Grilliot, Mary I., 4,918,760, Cl. 2-227.000.
Grilliot, William L.; and Grilliot, Mary I. Waterproof firefighter's glove. 4,918,756, Cl. 2-164.000.
Grilliot, William L.; and Grilliot, Mary I. Firefighter's trousers capable of receiving a booted foot. 4,918,760, Cl. 2-227.000.
Grimberg, Gerard. Guiding device for a portable machine. 4,919,384, Cl. 248-646.000.
Grip-Pak, Inc.: *See*—
Cunningham, Ernest R., 4,919,260, Cl. 206-150.000.
Grodzins, Lee. Radon detection. 4,920,270, Cl. 250-364.000.
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Gronau, Christian J., to Koettgen GmbH & Co. KG. Shelf conveying system. 4,919,056, Cl. 104-130.000.
Gros, Pierre: *See*—
Casellas, Pierre; Gros, Pierre; and Jansen, Franz, 4,919,927, Cl. 424-85.910.
Jansen, Franz; and Gros, Pierre, 4,919,928, Cl. 424-85.910.
Grosbois, Jean: *See*—
Gradeff, Peter S.; Schreiber, Fred G.; Grosbois, Jean; and Mauermann, Heiko, 4,920,204, Cl. 534-15.000.
Grosclaude, Gary V.: *See*—
Fotland, Richard A.; Grosclaude, Gary V.; and Briere, Richard L., deceased, 4,920,039, Cl. 430-324.000.
Grosfillex S.A.R.L.: *See*—
Guichon, Jean-Paul, 4,919,485, Cl. 297-443.000.
Grossi, Benedetto; and Bracci, Thomas W., to Circon Corporation. Resectoscope with improved guide block and electrical plug connection. 4,919,131, Cl. 606-46.000.
Grosz-Roell, Fritz; Mutsakis, Michael; and Rader, Robert G., to Sulzer Brothers Limited. Gas-liquid mass transfer apparatus and method. 4,919,541, Cl. 366-136.000.
Groveman, George R.: *See*—
Heldebrant, Charles M.; Crowe, Kim C.; Groveman, George R.; and Davis, Charles H., Jr., 4,919,895, Cl. 422-129.000.
Groves, Michael J.: *See*—
Alkan, M. Hayat; and Groves, Michael J., 4,919,973, Cl. 427-213.000.
Grubbs, Robert H.; Coots, Robert J.; and Pine, Stanley H., to California Institute of Technology. Synthetic polymer for endocapsular lens replacement. 4,919,151, Cl. 128-898.000.
Gruber, Robert J.: *See*—
Koch, Ronald J.; Knapp, John F.; and Gruber, Robert J., 4,920,023, Cl. 430-126.000.
Gruenbacher, Dana P.: *See*—
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Grumman Aerospace Corporation: *See*—
Kopsco, M. Alan, 4,919,489, Cl. 301-44.00T.
Grund, Peter: *See*—
Donath, Sabine; Grund, Peter; Holz, Peter; Jakobs, Udo; and Volker, Wolfgang, 4,918,876, Cl. 51-426.000.
GTE Laboratories Incorporated: *See*—
Stoddard, James C., 4,920,407, Cl. 358-21.00R.
Yu, Che-Fu, 4,919,545, Cl. 380-25.000.
GTE Products Corporation: *See*—
Mizuhara, Howard, 4,919,730, Cl. 148-24.000.
Rothwell, Harold L., Jr.; and English, George J., 4,920,459, Cl. 362-61.000.
Guerin, Jean-Michel: *See*—
Andrews, John R.; Haas, Werner E.; and Guerin, Jean-Michel, 4,920,364, Cl. 346-160.000.
Guichon, Jean-Paul, to Grosfillex S.A.R.L. Seats constructed of interlocking elements. 4,919,485, Cl. 297-443.000.
Guillaumon, Jean-Claude; and Blet, Louis J. C., to Centre Nationale d'Etudes Spatiales. Ionizable paints for use especially as anti-lightning paints. 4,920,163, Cl. 523-440.000.
Guillet, James E.: *See*—
Murray, Douglas G.; Smith, Dennis C.; and Guillet, James E., 4,920,158, Cl. 523-111.000.
Guimelli, Mark A., to Rees Operations Pty. Ltd. Vehicle safety screen fixing means. 4,919,467, Cl. 296-24.100.
Gundlach, Joseph J. Vacuum cleaner switch retainer. 4,920,244, Cl. 200-321.000.
Gundlach, William R.: *See*—
Duff, Terry L.; and Gundlach, William R., 4,919,282, Cl. 211-134.000.
Gupta, Mukat: *See*—
Tibbetts, Hubert M.; and Gupta, Mukat, 4,919,838, Cl. 252-117.000.
Gustafson, Alan D.; Naley, Lowell B.; Christiansen, David A.; Hoium, Stanley O.; Harrington, Robert L.; Johnson, Dannis R.; and Truckenbrod, Gregory R., to Thermo King Corporation. Method of controlling the capacity of a transport refrigeration system. 4,918,932, Cl. 62-89.000.
Gustafson, Kenneth L.: *See*—
Romano, Timothy S.; and Gustafson, Kenneth L., 4,919,291, Cl. 220-2.200.
H. R. Krueger Machine Tool Inc.: *See*—
Moore, Bruce L.; and Cottam, Graham D., 4,918,826, Cl. 33-645.000.
Haas, Werner E.: *See*—
Andrews, John R.; Haas, Werner E.; and Guerin, Jean-Michel, 4,920,364, Cl. 346-160.000.
Habara, Hideaki: *See*—
Itoh, Hajime; Takahashi, Hiroshi; Ohbori, Kouji; and Habara, Hideaki, 4,919,810, Cl. 210-500.340.
Haber, Terry M.; and Foster, Cark B., to Habley Medical Technology Corporation. Dental syringe having a medication filled carpule and a retractable needle cannula. 4,919,657, Cl. 604-232.000.
Haberer, Ernst-August: *See*—
Engel, Georg; and Haberer, Ernst-August, 4,918,964, Cl. 72-225.000.
Habley Medical Technology Corporation: *See*—
Haber, Terry M.; and Foster, Cark B., 4,919,657, Cl. 604-232.000.
Hachey, Raynald; Lamarre, Daniel; and Marcotte, Jacques, to Alcan International Limited. Method and apparatus for the measurement of the thermal conductivity of gases. 4,918,974, Cl. 73-27.00R.
Hachmann, Klaus: *See*—
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Hachtel, Ludwig: *See*—
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Hack, James R., to Calcomp Inc. Method of manufacturing electrostatic printer heads. 4,920,363, Cl. 346-155.000.
Hadaway, Edward S.: *See*—
Stratford, Brian S.; Hadaway, Edward S.; Chew, John; and Hartland, Howard G., 4,919,590, Cl. 415-116.000.
Hadravsky, Milan: *See*—
Petran, Mojmir; and Hadravsky, Milan, 4,919,516, Cl. 350-171.000.
Haese, Wilfried: *See*—
Ebert, Wolfgang; Haese, Wilfried; Vogelsgesang, Roland; and Dhein, Rolf, 4,919,514, Cl. 350-96.340.
Hagen, Susan E.: *See*—
Domagala, John M.; Hagen, Susan E.; and Kiely, John S., 4,920,120, Cl. 514-254.000.
Hagihara, Hideaki; and Honda, Iwakazu, to Sharp Kabushiki Kaisha. Image formation method and apparatus using light and pressure sensitive sheets. 4,920,026, Cl. 430-138.000.
Hagler, Herbert K., to Board of Regents, The University of Texas System. Cryogenic ultramicrotome seal. 4,918,941, Cl. 62-320.000.
Hahlert, Wolfgang: *See*—
Kallinich, Dietmar; Hahlert, Wolfgang; and Thom, Peter, 4,919,170, Cl. 138-39.000.
Hahn, Robert B., to Atlantic Group, Inc., The. Multiple locking stake for tube bundle. 4,919,199, Cl. 165-162.000.
Haid, Robert: *See*—
Leiber, Heinz; Klinkner, Walter; and Haid, Robert, 4,919,444, Cl. 280-707.000.
Haile, Hudson C. Folding sleeper shell. 4,918,772, Cl. 5-119.000.
Haines, Peter R., to Lin Pack Mouldings Limited. Container assembly and method of constructing such an assembly. 4,919,299, Cl. 220-404.000.
Haldor Topsoe A/S: *See*—
Blom, Niels J., 4,919,908, Cl. 423-328.000.
Hall, Henry K.: *See*—
Thaler, Warren A.; Brois, Stanley J.; and Hall, Henry K., 4,920,179, Cl. 525-285.000.
Hall, John H., to Linear Integrated Systems, Inc. Conductance-modulated integrated transistor structure. 4,920,399, Cl. 357-42.000.
Hall, Nelson W.; and Kotzebue, Paul, to Swath Ocean Systems, Inc. Hull construction for a swath vessel. 4,919,063, Cl. 114-56.000.
Hallco Fabricators, Inc.: *See*—
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Hallenbach, Werner: *See*—
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Halliburton Company: *See*—
Stegemoeller, Calvin L.; and Davis, Gail F., 4,919,540, Cl. 366-132.000.
Halling, Horace P.; and Oh, Thomas S., to EG&G Pressure Science, Inc. Low profile V-coupling. 4,919,453, Cl. 285-3.000.
Halpin, Terence: *See*—
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Hamada, Emiko: *See*—
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Hamagishi, Goro: *See*—
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Hamamatsu Photonics Kabushiki Kaisha: *See*—
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Hamasaki, Yoshiaki: *See*—
Hiramatsu, Takeo; Fujita, Kenjiro; Nagayoshi, Yoshimasa; Hirakushi, Shuzo; and Hamasaki, Yoshiaki, 4,919,248, Cl. 192-61.000.

Hammond, Gary N.; Taylor, Michael D.; and Taylor, Nongnuch, to Amdahl Corporation. Error recovery scheme for destaging cache data in a multi-memory system. 4,920,536, Cl. 371-10.100.

Hammond, Nathan J. Apparatus and method for handling returnable beverage container. 4,919,274, Cl. 209-583.000.

Hamner, Glen P., deceased (by Hamner, Nita A. M., executrix); Sawyer, Willard H.; and Boucher, Heather A., to Exxon Research and Engineering Company. Process for the hydroisomerization of wax to produce middle distillate products. 4,919,786, Cl. 208-27.000.

Hamner, Nita A. M., executrix: *See*—
Hamner, Glen P., deceased; Sawyer, Willard H.; and Boucher, Heather A., 4,919,786, Cl. 208-27.000.

Hanada, Yoshihiro: *See*—
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Hanaoka, Tadashi; Kondo, Yoshimi; and Isobe, Ikuo, to Takeda Chemical Industries, Ltd. Method for production of stabilized sodium ascorbate powder. 4,920,150, Cl. 514-474.000.

Hancock, Joseph: *See*—
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Handermann, Alan C.: *See*—
Dykstertouse, Robert; Dykstertouse, Joel A.; Handermann, Alan C.; and Western, Edward D., 4,919,739, Cl. 156-181.000.

Handke, Heinz; Zink, Thomas; and Sougioltzis, Vasilios, to Behr Industrieanlagen GmbH & Co. Method and apparatus for coating parts in series. 4,919,967, Cl. 427-8.000.

Handler, Howard, to Deltec Electronics Corporation. Crest factor correction circuit. 4,920,472, Cl. 363-95.000.

Handwerk, Hans-Peter: *See*—
Ritter, Wolfgang; Handwerk, Hans-Peter; and Carduck, Franz-Josef, 4,920,090, Cl. 502-439.000.

Haneda, Makoto: *See*—
Aiki, Kunio; Sasayama, Atsushi; Nemoto, Tugio; Haneda, Makoto; Ishii, Satoru; Kugimiya, Haruo; and Kawasaki, Tutomu, 4,920,262, Cl. 250-227.110.

Hanegraaf, John C. Tab top beverage container opener. 4,919,016, Cl. 81-3.550.

Hankinson, Michael F.; Swidwa, Kenneth J.; and Salton, Robert B., to Westinghouse Electric Corp. Reactor internals through-hole grapple. 4,919,881, Cl. 376-260.000.

Hann, Richard A.; Holmes, David R.; and Smith, John W., to Imperial Chemical Industries PLC. Membranes. 4,920,193, Cl. 528-171.000.

Hannay, Richard C.: *See*—
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Hannon, Charles N., to Stepper, Inc. Newspaper handling and collating method and apparatus. 4,919,413, Cl. 271-133.000.

Hans, Helmut: *See*—
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Hans, Lyan M.: *See*—
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Hanyu, Masaaki: *See*—
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Haque, Yasmeen: *See*—
Horbett, Thomas A.; Ratner, Buddy D.; Chinn, Joseph A.; and Haque, Yasmeen, 4,919,659, Cl. 623-1.000.

Hara, Junichiro; Ogihara, Yoshiyuki; and Mochizuki, Akira, to Nissan Motor Co., Ltd. Automobile air conditioning system. 4,919,328, Cl. 236-49.300.

Harada, Nobuyuki: *See*—
Irie, Yoshio; Iwasaki, Kaoru; Hatsuda, Takumi; Kimura, Kazumasa; Harada, Nobuyuki; Ishizaki, Kunihiko; Shimomura, Tadao; and Fujiwara, Teruaki, 4,920,202, Cl. 528-500.000.

Harada, Yasuhiro: *See*—
Mitui, Syuzi; Waki, Kouichirou; and Harada, Yasuhiro, 4,919,097, Cl. 123-399.000.

Harandi, Mohsen N.; Owen, Hartley; and Tabak, Samuel A., to Mobil Oil Corporation. Multistage catalytic reactor system for production of heavy hydrocarbons. 4,919,896, Cl. 422-142.000.

Harbeke, Gerold J. Method of using a toilet-flange cast-in mount. 4,918,761, Cl. 4-252.00R.

Hardin, James A. Clothing button guard. 4,918,791, Cl. 24-90.500.

Harding, David K. Light beam amplifier. 4,920,469, Cl. 362-300.000.

Harding, George W., to Poly-John Enterprises Corp. Portable toilet cabana. 4,918,765, Cl. 4-460.000.

Hardt, Thomas: *See*—
Bonfert, Helmut; Hardt, Thomas; Klumpp, Rolf; and Wagner, Wolf-Dietrich, 4,919,371, Cl. 248-56.000.

Harms, Susan D., to Amoco Corporation. Multicomponent organic liquid and use thereof in treating wells and subterranean formations. 4,919,827, Cl. 252-8.553.

Harnisch, Horst, to Bayer Aktiengesellschaft. Process for the quenching of fluorescence, and new cationic naphthalene-peri-dicarboxylic acid imide derivatives. 4,919,848, Cl. 252-600.000.

Harper, Ralph G.: *See*—
Keller, Stephen A.; Spry, Piper A.; Adams, Martha S.; and Harper, Ralph G., 4,920,072, Cl. 437-192.000.

Harpers: *See*—
Benoit, Fredrick C.; Cardenas, Ruben; Schmid, Daniel; and Wisniewski, Joseph M., 4,918,886, Cl. 52-221.000.

Harricana Metal, Inc.: *See*—
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Harrington, Philip M.: *See*—
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Harrington, Robert L.: *See*—
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Harris, David C.: *See*—
Lawson, James L.; and Harris, David C., 4,919,003, Cl. 74-471.0XY.

Harris, Geoffrey J., to Square D Company. Proximity switch circuit. 4,920,281, Cl. 307-308.000.

Harris, Gerald E., to Campbell Soup Corporation. Fluidized bed flight apparatus. 4,918,829, Cl. 34-10.000.

Harris, Gerald F.: *See*—
Millar, Edward A.; Harris, Gerald F.; and Fink, Roy G., 4,919,672, Cl. 623-22.000.

Harrison, George E.: *See*—
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Harrison, Joel N.: *See*—
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Harsco Corporation: *See*—
Eigenbrod, Lester K., 4,918,927, Cl. 62-45.100.

Hartgring, Cornelis D.; Dikken, Jan; and Poorter, Tiemen, to U.S. Philips Corp. Output buffer having reduced electric field degradation. 4,920,287, Cl. 307-542.000.

Harth, Robert: *See*—
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Hartig, Klaus: *See*—
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Hartland, Howard G.: *See*—
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Hartline, Michael F.; and White, Nikki O., to Super Sagless Corp. Sofa bed with closing and opening assist. 4,918,770, Cl. 5-13.000.

Hartmann, Leonard J.; and Weller, Michael E., to Dynaquip Controls Corporation. Blow gun assembly. 4,919,334, Cl. 239-600.000.

Harusawa, Fuminori: *See*—
Nakama, Yasunari; Harusawa, Fuminori; Otsubo, Kyoko; Iwai, Tsunehiko; Tamaki, Shuya; and Ohkoshi, Masahiro, 4,919,846, Cl. 252-542.000.

Harvell, John T.: *See*—
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Harvey, Billy R.; and Rohrer, David W., to Life-Link International, Inc. Pull for slide fastener sliders. 4,918,794, Cl. 24-429.000.

Harvey, Larry B.: *See*—
Mak, Stephen M., 4,919,950, Cl. 426-233.000.

Hasebe, Atsushi; and Kato, Ryohei, to Sony Corporation. Multiple mode microprogram controller. 4,920,482, Cl. 364-200.000.

Hasegawa, Hiroaki: *See*—
Kato, Takashi; Morita, Yutaka; Yamaguchi, Takeshi; Tsuge, Kazuo; Imamura, Kyoji; Kawai, Yoshio; Hasegawa, Hiroaki; and Amemori, Hiroyuki, 4,918,996, Cl. 73-861.910.

Hasegawa, Shinichi; and Hanyu, Masaaki, to Pioneer Electronic Corporation. Screen for a rear projection type television set. 4,919,515, Cl. 350-128.000.

Haselwerdt, Vernon W.; and Mayfield, John M., Jr., to Microphor, Inc. Electrically operated toilet. 4,918,764, Cl. 4-406.000.

Hashiguchi, Tatsuro, to NEC Corporation. Multiprocessor system with storage control units including buffer storage units comprising an error recovery system for storage control units. 4,920,479, Cl. 364-200.000.

Hashimoto Corporation: *See*—
Hashimoto, Kazuo, 4,920,559, Cl. 379-74.000.

Hashimoto, Kazuo, to Hashimoto Corporation. Telephone answering device with remote control timing mark. 4,920,559, Cl. 379-74.000.

Hashimoto, Takeshi: *See*—
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Haskett, Wayne J.; Andersen, Leonard; and Andersen, John A. Display unit for consumer products. 4,919,287, Cl. 211-41.000.

Haste, Robert H.: *See*—
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Hasumi, Kazuo: *See*—
Anazawa, Takanori; Hasumi, Kazuo; and Ono, Yoshiyuki, 4,919,856, Cl. 264-22.000.

Hata, Yasuo; and Takahashi, Kenkichi, to Idemitsu Kosan Company Limited. Selective gas permeation membranes and method of manufacturing them. 4,919,694, Cl. 55-158.000.

Hata, Yukihiro: *See*—
Koike, Hiroyuki; Hata, Yukihiro; and Sogabe, Mitsushi, 4,919,388, Cl. 249-115.000.

Hatae, Shinkichi, to Sansho Seiyaku Co., Ltd. Compositions for topical use having melanin synthesis-inhibiting activity. 4,919,921, Cl. 424-62.000.

Hatamura, Koichi: *See*—
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Hatori, Yoshinori; Koga, Toshio; Matsuda, Kiichi; and Mukawa, Naoki, to Kokusai Denshin Denwa Co., Ltd.; NEC Corporation; Fujitsu Limited; and Nippon Telegraph and Telephone Corporation. Image coding system coding digital image signals by forming a histogram of a coefficient signal sequence to estimate an amount of information. 4,920,426, Cl. 358-433.000.

Hatsuda, Takumi: *See*—
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Haubert, Michael V.: *See*—
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Hawke Cable Glands Limited: *See*—
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Hay, James V.; and Wolf, Anthony D., to Du Pont de Nemours, E. I., and Company. Thiazole derivatives. 4,919,706, Cl. 71-90.000.

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Hayashi, Katsumi, to Fuji Photo Film Co., Ltd. Image forming method. 4,920,035, Cl. 430-267.000.

Hayashi, Keizo; and Nozaki, Masahiro, to Toyoda Gosei Co., Ltd. Opening trim. 4,918,867, Cl. 49-490.000.

Hayashi, Masahiko; Innami, Yoshiyuki; and Teshima, Naoto, to Kabushiki Kaisha Meidensha. Material for resistor body and non-linear resistor made thereof. 4,920,328, Cl. 338-21.000.

Hayashi, Noriyuki; and Hijikata, Kenji, to Polyplastics Co., Ltd. Polyester resin exhibiting optical anisotropy in molten state which contains a low concentration of 6-oxy-2-naphthoyl units and composition thereof. 4,920,197, Cl. 528-190.000.

Hayes, George K. C. Three dimensional toy structure. 4,919,982, Cl. 428-34.200.

Hazelden, Roger J.: *See*—
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Hazenbroek, Jacobus E. Poultry lung extractor and neck breaker. 4,918,787, Cl. 17-11.000.

Heaps, Harry D., Jr.; and Boy, Charles E., to Connelly Containers, Inc. Container for fluent material including a ring-like holder for a bag. 4,919,306, Cl. 222-105.000.

Hearthstone Builders, Inc.: *See*—
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Heaton, Robert A.; Leach, Stuart C.; Hancock, Joseph; and Sandy, Neil A., to BOC Group PLC. Anaesthetic vaporisers. 4,919,125, Cl. 128-203.140.

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Heck, James V.: *See*—
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Heckert, David C., to Procter & Gamble Company, The. Method of preparing fruit juice beverages and juice concentrates nutritionally supplemented with calcium. 4,919,963, Cl. 426-599.000.

Hedengren, Kristina H.: *See*—
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Heideman, Robert J. Wheel assembly. 4,919,491, Cl. 301-124.00R.

Heldebrant, Charles M.; Crowe, Kim C.; Groveman, George R.; and Davis, Charles H., Jr., to Alpha Therapeutic Corporation. Apparatus for oxygenation of liquid state dissolved oxygen-carrying formulation. 4,919,895, Cl. 422-129.000.

Helix Technology Corporation: *See*—
Gaudet, Peter W.; Olsen, Donald A.; Eacobacci, Michael J.; Harvell, John T.; Lepofsky, Robert J.; Roche, David E.; and Bender, Steven A., 4,918,930, Cl. 62-55.500.

Heller, William C., Jr.: *See*—
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Helm, James G.: *See*—
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Helmet Limited, Moat Factory: *See*—
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Helton, Andrew C.: *See*—
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Henderson, David L.; and Stanchak, Carl M., to NCR Corporation. Digitally compensated multiplying digital to analog converter. 4,920,344, Cl. 341-118.000.

Henderson, Herman O., Jr.: *See*—
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Hendricks, Udo: *See*—
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Henke, James L.: *See*—
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Henke, Jerome R.: *See*—
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Henkel Corporation: *See*—
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Henkel Kommanditgesellschaft auf Aktien: *See*—
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Lehmann, Rudolf; Hachmann, Klaus; Biermann, Manfred; and Schnegelberger, Harald, 4,920,100, Cl. 514-23.000.
Ritter, Wolfgang; Handwerk, Hans-Peter; and Carduck, Franz-Josef, 4,920,090, Cl. 502-439.000.
Vogt, Guenther; Andree, Hans; and Nienhaus, Gertrud, 4,919,845, Cl. 252-526.000.

Henning, Rainer: *See*—
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Henry Filters, Inc.: *See*—
Creps, John L.; and Kelley, Matthew O., 4,919,824, Cl. 210-770.000.

Hensel, Hartmut; Laing, Oliver; and Laing, Karsten. Reciprocating machine. 4,919,104, Cl. 123-533.000.

Heraeus Elektroden GmbH: *See*—
Kotowski, Stephan; Busse, Bernd; and Donnerhak, Bernd, 4,919,766, Cl. 204-153.100.

Herbrechtsmeier, Peter: *See*—
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Herbstman, Sheldon; and Nalesnik, Theodore E., to Texaco Inc. Stable middle distillate fuel-oil compositions. 4,919,685, Cl. 44-62.000.

Herbstman, Sheldon: *See*—
Nalesnik, Theodore E.; and Herbstman, Sheldon, 4,919,683, Cl. 44-62.000.
Nalesnik, Theodore E.; and Herbstman, Sheldon, 4,919,684, Cl. 44-62.000.

Hercules Incorporated: *See*—
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Heritage Industries, Inc.: *See*—
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Hermann, Siegbert, to Ostermann & Scheiwe GmbH & Co. KG. Air-drying stains and finishing coats for wood for exterior and interior finishes. 4,919,721, Cl. 106-34.000.

Hermann, Wolfgang: *See*—
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Hermens, Joannes L. G., to U.S. Philips Corporation. X-ray apparatus comprising an adjustable slit-shaped collimator. 4,920,552, Cl. 378-153.000.

Herold, Wolf-Dietrich; and Koraa, Peter, to ESPE Stiftung & Co. Produktions- und Vertriebs KG. Device for repairing windshields. 4,919,603, Cl. 425-12.000.

Herren, Blair J.: *See*—
Herrmann, Frederick T.; and Herren, Blair J., 4,919,899, Cl. 422-245.000.

Herriott, Ray G.: *See*—
Stoy, Michael A.; Dusek, Vaclav; Patel, Anilbhai S.; and Herriott, Ray G., 4,919,130, Cl. 606-107.000.

Herrmann, Frederick T.; and Herren, Blair J. Crystal growth apparatus. 4,919,899, Cl. 422-245.000.

Herrmann, Otfrid: *See*—
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Herscovici, Calman, to Electric Power Research Institute, Inc. Porous and porous-nonporous composites for battery electrodes. 4,920,017, Cl. 429-42.000.

Hesse, Kurt. Toy vehicle. 4,919,639, Cl. 446-462.000.

Hetland, Amund; and Hoie, Odd T., to Trallfa Robot A/S. Method and robot installation for programmed control of a working tool. 4,920,500, Cl. 364-513.000.
Heuer, Glenn C.: *See*—
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Hewlett-Packard Company: *See*—
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Johnson, David A., 4,920,357, Cl. 346-49.000.
Lovelock, James E., 4,919,690, Cl. 55-2.000.
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Higashi, Tsuneo; and Izuwa, Akio, to Mitsubishi Jukogyo Kabushiki Kaisha. Supercooling type mist eliminator apparatus. 4,919,696, Cl. 55-269.000.
Higashimata, Akira; and Yasuno, Yoshiki, to Nissan Motor Company, Limited. Anti-skid brake control system with avoidance of abrupt and substantial variation of wheel slippage. 4,919,494, Cl. 303-100.000.
Higashino, Hiroki: *See*—
Seki, Masao; and Higashino, Hiroki, 4,919,710, Cl. 55-417.000.
Higgins, Carl. Automatic boat-trailer locking assembly. 4,919,446, Cl. 280-414.100.
Hijikata, Kenji: *See*—
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Hilbert, Marcel; and Gittos, Maurice W., to Merrell Dow Pharmaceuticals Inc. Aromatic 2-aminoalkyl-1,2-benzoisothiazol-3-(2H)one-1,1-dioxide and their use as anxiolytic and anti-hypertensive agents. 4,920,118, Cl. 514-224.200.
Hill, Gary R., to Micromatic Textron Inc. Machine for splining clutch hubs with close tolerance spline bellmouth and oil seal surface roundness. 4,918,961, Cl. 72-88.000.
Hille, Martin: *See*—
Wallhausser, Karl H.; Hille, Martin; Bucking, Hans-Walter; and Hofinger, Manfred, 4,920,151, Cl. 514-634.000.
Himi, Kohei, to Chubu Industries, Inc. Ice slicer with syrup supply mechanism. 4,919,075, Cl. 118-699.000.
Himmler, Gunther, to Gebr. Hofmann GmbH & Co. KG Maschinenfabrik. Apparatus for checking motor vehicle tires. 4,918,983, Cl. 73-146.000.
Hinger, Klaus-Jurgen, to Werner & Pfleiderer GmbH. Apparatus for converting sewage sludge filter cake by pyrolysis. 4,919,763, Cl. 202-113.000.
Hinotani, Katsuhiro; Kishimoto, Shunichi; Kosaka, Haruhisa; Terada, Katsumi; and Hamagishi, Goro, to Sanyo Electric Co., Ltd. Flat fluorescent lamp for liquid crystal display. 4,920,298, Cl. 313-493.000.
Hirai, Shoichi, to Nippon Cable System Inc. Window opener. 4,918,865, Cl. 49-347.000.
Hirai, Toshio; and Yamane, Hisanori, to Sumitomo Metal Mining Co., Ltd. Zirconia film and process for preparing it. 4,920,014, Cl. 428-698.000.
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Hiraki, Hikosaburo; Murakami, Toshibumi; and Kusakabe, Akira, to Kabushiki Kaisha Komatsu Seisakusho. Internal combustion engine. 4,919,093, Cl. 123-299.000.
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Hiramatsu, Takeo; Fujita, Kenjiro; Nagayoshi, Yoshimasa; Hirakushi, Shuzo; and Hamasaki, Yoshiaki, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha; and Koyo Seiko Kabushiki Kaisha. Drive coupling unit. 4,919,248, Cl. 192-61.000.
Hiramatsu, Yoshiyuki: *See*—
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Hiraoka, Tetsuo: *See*—
Ogami, Muneyuki; Kawasako, Yasuhiro; Otsuka, Takenori; Hiraoka, Tetsuo; and Hatamura, Koichi, 4,919,087, Cl. 123-52.0MV.
Hirasawa, Mashide: *See*—
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Hirashima, Atsushi: *See*—
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Hirata, Yoshihiro, to Kabushiki Kaisha Toshiba. Facsimile apparatus. 4,920,427, Cl. 358-437.000.
Hird, John A.; Owen, Lindsey D.; and Rice, Michael R., to Intellicall, Inc. Method and apparatus for downloading speech files. 4,920,558, Cl. 379-67.000.
Hird, John A.; Owen, Lindsey D.; and Rice, Michael R., to Intellicall, Inc. Automatic generation of billing records at a telephone paystation. 4,920,562, Cl. 379-132.000.
Hitachi Cable, Ltd.: *See*—
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Aiki, Kunio; Sasayama, Atsushi; Nemoto, Tugio; Haneda, Makoto; Ishii, Satoru; Kugimiya, Haruo; and Kawasaki, Tutomu, 4,920,262, Cl. 250-227.110.
Ishigaki, Yukio; and Sonobe, Tadasi, 4,920,095, Cl. 505-1.000.
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Kobayashi, Kazuo; Kajiwara, Toshiyuki; Sekiya, Teruo; and Kimura, Tomoaki, 4,918,965, Cl. 72-243.000.
Kobayashi, Toshio; Otomo, Shigekazu; Nakatani, Ryoichi; and Kumasaka, Noriyuki, 4,920,013, Cl. 428-694.000.
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Manaka, Toshio; and Shida, Masami, 4,919,096, Cl. 123-399.000.
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Sasaki, Ryoichi; Nakamura, Tsutomu; Suzuki, Michio; Shinnai, Kohsuke; Ido, Nobuhiko; and Tsunoda, Tomoaki, 4,920,529, Cl. 370-16.000.
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Tateishi, Akitaka; Arakawa, Tadao; Kurosawa, Masaru; Kubo, Yoshifumi; and Nagai, Yoji, 4,920,276, Cl. 290-2.000.
Yoshio, Shintani; and Mikio, Inatsu, 4,920,398, Cl. 357-42.000.
Hitachi Maxell, Ltd.: *See*—
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Hitachi Micro Computer Engineering Ltd.: *See*—
Sasaki, Ryoichi; Nakamura, Tsutomu; Suzuki, Michio; Shinnai, Kohsuke; Ido, Nobuhiko; and Tsunoda, Tomoaki, 4,920,529, Cl. 370-16.000.
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Hitachi Powdered Metals Co., Ltd.: *See*—
Abe, Makoto; Tanimoto, Ichiro; Fujiki, Akira; Suzuki, Keitaro; Endo, Hiroyuki; and Ikenoue, Yutaka, 4,919,719, Cl. 75-243.000.
Hitachi Tobu Semiconductor: *See*—
Aiki, Kunio; Sasayama, Atsushi; Nemoto, Tugio; Haneda, Makoto; Ishii, Satoru; Kugimiya, Haruo; and Kawasaki, Tutomu, 4,920,262, Cl. 250-227.110.
Hitzler, Terry. Multi-cell drink container. 4,919,295, Cl. 220-23.830.
Hiyama, Hirokuni: *See*—
Murakami, Chikara; Nakajima, Atsushi; Hiyama, Hirokuni; Inanaga, Satoshi; and Watanabe, Katsuhide, 4,920,290, Cl. 310-90.500.
Hmida, Hedi; and Duhamel, Pierre, to Etat Francais, represente par le ministres Delegue des Postes et Telecommunications (Centre National d'Etudes des Telecommunications). Binary calculation circuit. 4,920,509, Cl. 364-784.000.
Ho, W. S. Winston: *See*—
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Hobbs Bonded Fibers: *See*—
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Hobbs, Claude C.: *See*—
Carpenter, Tim D.; and Hobbs, Claude C., 4,918,861, Cl. 47-59.000.
Hobson, David O.; Alexeff, Igor; and Sikka, Vinod K., to United States of America, Energy. Method and apparatus for atomization and spraying of molten metals. 4,919,335, Cl. 239-3.000.
Hobson, Russell, Jr. Control system for pump cycling. 4,919,801, Cl. 210-104.000.
Hodge, James D.: *See*—
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Hoebener, Karl G.; and Stankus, John J., to International Business Machines Corporation. Solder deposition control. 4,919,970, Cl. 427-96.000.

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Rehberg, Heinrich; and Behringer, Hartmut, 4,920,205, Cl. 534-582.000.
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Hoechst Roussel Pharmaceuticals Inc.: *See*—
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Shutske, Gregory M., 4,920,117, Cl. 514-212.000.

Hoeffkes, Horst; Lange, Fritz; and Ansmann, Achim, to Henkel Kommanditgesellschaft auf Aktien. Cosmetic emulsions having improved flow behavior. 4,919,923, Cl. 424-70.000.

Hoekstra, Frans, to Thomassen & Drijver-Verblifa N.V. Method and device for packaging an elongate body. 4,918,905, Cl. 53-411.000.

Hoekwater, Mark A.; Paren, Anthony R.; Kasting, Thomas; and Rollins, Richard, to Baxter International Inc. Large bore tubing roller clamp. 4,919,389, Cl. 251-6.000.

Hoell, Norbert: *See*—
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Hoffman, Kenneth L. Apparatus and method of detecting leaks in pressurized piping systems. 4,918,968, Cl. 73-40.000.

Hoffman, Thomas: *See*—
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Hoffmann-La Roche Inc.: *See*—
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Hofinger, Manfred: *See*—
Wallhausser, Karl H.; Hille, Martin; Bucking, Hans-Walter; and Hofinger, Manfred, 4,920,151, Cl. 514-634.000.

Hofmeister, Peter: *See*—
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Hohberg, Gerhard; and Gerlinger, Hermann, to Carl-Zeiss-Stiftung. Reflectance measuring apparatus for making contactless measurements. 4,919,535, Cl. 356-429.000.

Hoiberg, Dane A.; Hatfield, G. Wesley; Moyed, Harris S.; and Sharp, Janice A., to American Biogenetics Corporation. Conversion of alcohols to aldehydes and hydrogen peroxide by substrate and product tolerant methanol oxidases. 4,920,055, Cl. 435-147.000.

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Hojyo, Tetsuya. Method of molding a pin holder on a lead frame. 4,919,857, Cl. 264-22.000.

Hokbrook, James G.; and Jaks, Otto J., to Resonex, Inc. Head of body coil assembly for magnetic resonance imaging apparatus. 4,920,315, Cl. 324-313.000.

Hoke, Duane E.; Kimball, Ronald L.; and Quinn, David E., to Corning Incorporated. Optical fiber connector and method. 4,919,510, Cl. 350-96.210.

Hokkai Can Co., Ltd.: *See*—
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Holben, David V.: *See*—
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Holbert, Gene W.; and Johnston, J. O'Neal, to Merrell Dow Pharmaceuticals Inc. 19-fluoro- or cyano-21-hydroxyprogesterone derivatives useful as 19-hydroxylase inhibitors. 4,920,114, Cl. 514-177.000.

Holcomb, Manuel: *See*—
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Holden, Karel; and Holdenova, Ladislava. Alternator. 4,920,295, Cl. 310-209.000.

Holdenova, Ladislava: *See*—
Holden, Karel; and Holdenova, Ladislava, 4,920,295, Cl. 310-209.000.

Holdom, Kelvin S.; Ruddock, John C.; Tone, Junsuke; Maeda, Hiroshi; and Jefson, Martin R., to Pfizer Inc. Antibiotic produced by fermentation. 4,920,215, Cl. 536-16.800.

Holland, G. Neil: *See*—
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Holland, Karey L.: *See*—
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Holland-Letz, Guenter: *See*—
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Holland, Orin W.; Fathy, Dariush; and White, Clark W., to United States of America, Energy. Method for enhancing growth of SiO_2in Si by the implantation of germanium. 4,920,076, Cl. 437-238.000.

Holley, John M., Jr.: *See*—
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Hollinrake, Mark S.: *See*—
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Holmes, Leslie M., Jr.: *See*—
Mahoney, Murray W.; and Holmes, Leslie M., Jr., 4,919,323, Cl. 228-157.000.

Holston, Sylvester; Ziek, Robert; and Woodruff, William, to Drackett Company, The. Process for bottling liquid products which will contain fragrance oils. 4,918,903, Cl. 53-471.000.

Holz, Peter: *See*—
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Homer, Nigel J.: *See*—
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Homma, Dai. Method of treating Ti-Ni shape memory alloy. 4,919,177, Cl. 148-133.000.

Homsy, Charles A. Implantation of articulating joint prosthesis. 4,919,665, Cl. 623-18.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
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Honda, Iwakazu: *See*—
Hagihara, Hideaki; and Honda, Iwakazu, 4,920,026, Cl. 430-138.000.

Honda, Narimichi: *See*—
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Honeywell Inc.: *See*—
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Schwartz, Kenneth E., 4,920,343, Cl. 341-33.000.

Hong, Pil-Young; Oh, Tae-Yup; Kim, Chun-Joong; and Kang, Sang-Suk, to Samsung Electronic Co. Ltd. Process for fabricating a high-speed CMOS TTL semiconductor device. 4,920,066, Cl. 437-57.000.

Hongu, Kazuoki: *See*—
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Honma, Hideaki: *See*—
Sawada, Hachiro; Fujitsu, Tadashi; Takahashi, Ken-ichi; and Honma, Hideaki, 4,920,504, Cl. 364-521.000.

Honma, Tohru; Mori, Shigeki; Ohya, Kunihiko; Matsumoto, Shiro; Nakata, Akira; Abe, Ichiro; and Hosaka, Naoto, to Hokkai Can Co., Ltd.; and Kirin Brewery Co., Ltd. Method of and apparatus for filling inert gas in a can. 4,918,902, Cl. 53-403.000.

Honoki, Teruyosi: *See*—
Takahashi, Yasuhiko; Tamura, Kunimitsu; Niimura, Nagato; Asao, Keizo; Honoki, Teruyosi; Masui, Tadaaki; and Ishizaka, Masuo, 4,918,977, Cl. 73-40.50R.

Honsberger, Calvin P. Controlled stratified random area illuminator. 4,920,467, Cl. 362-226.000.

Hoogovens Groep B.V.: *See*—
Kruit, Jan; and Knapen, Joannes W. J., 4,919,273, Cl. 209-517.000.

Hooks, Hilary N.: *See*—
Binkley, Joseph H.; Caro, Perry A.; Dillon, John B.; Fay, Charles R.; Gibbons, Jonathan; Hooks, Hilary N.; Kadifa, Abdo G.; Lee, Jeffery W.; Lynch, William C.; Mock, Clayton W.; Neely, Everett T.; Tallan, Michael L.; Thompson, Geoffrey O.; Vukkadala, Gaya; Wick, John D.; and Woods, Donald R., 4,920,481, Cl. 364-200.000.

Hoots, John E.: *See*—
Fong, Dodd W.; Hoots, John E.; Johnson, Donald A.; and Kneller, James, 4,919,821, Cl. 210-698.000.

Hoover Universal, Inc.: *See*—
Tiedemann, William H.; and Marshall, Dennis L., 4,919,284, Cl. 215-12.100.

Hopkins, James P.: *See*—
Fantozzi, Louis R.; and Hopkins, James P., 4,919,519, Cl. 350-253.000.

Hopkins, Mark W.; and Principe, Frank S., to Du Pont de Nemours, E. I., and Company. Vehicle wheel. 4,919,490, Cl. 301-63.0PW.

Hora, Ferdinand, to Von Roll Transportsysteme AG. Switching device for an overhead cable transport. 4,919,055, Cl. 104-130.000.

Horaguchi, Mitsuhiro; Tomizawa, Shigechika; and Kaihara, Yuji, to Mitsubishi Jukogyo Kabushiki Kaisha. Process for the systematic treatment of exhaust gases. 4,919,905, Cl. 423-239.000.

Horbett, Thomas A.; Ratner, Buddy D.; Chinn, Joseph A.; and Haque, Yasmeen, to University of Washington, The Board of Regents for

the. Radio frequency plasma deposited polymers that enhance cell growth. 4,919,659, Cl. 623-1.000.
Hordyk, Jan: *See*—
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Horiba, Yasutaka: *See*—
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Horie, Hiromichi: *See*—
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Horie, Nobuyuki: *See*—
Sakamoto, Noriaki; Nishioka, Yoshiki; Yamanaka, Toshihiro; Horie, Nobuyuki; Kobayashi, Shozou; Deguchi, Toshihisa; and Maeda, Shigemi, 4,920,528, Cl. 369-54.000.
Horii, Masahiro: *See*—
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Horii, Shoichi: *See*—
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Horikoshi, Tadao; Naganuma, Hisao; Sugimoto, Minoru; and Numao, Masanobu, to Sanyo Electric Co., Ltd. Radiant-type heater. 4,919,120, Cl. 126-93.000.
Horkey, Gregory R. Collapsible and reformable headrest for vehicles. 4,919,483, Cl. 297-395.000.
Horodysky, Andrew G., to Mobil Oil Corporation. Multifunctional ester-type additives. 4,919,831, Cl. 252-47.500.
Horodysky, Andrew G.: *See*—
Farng, Liehpao O.; and Horodysky, Andrew G., 4,919,830, Cl. 252-327.00E.
Horst, Lautenschlager, to Karl Lautenschlager GmbH & Co. KG. Drawer guide. 4,919,548, Cl. 384-19.000.
Horstmann, Dennis G.; and Jones, Douglas S., to Petrolite Corporation. Synergistic biocides of certain nitroimidazoles and aldehydes. 4,920,141, Cl. 514-398.000.
Hosaka, Hideaki; Nakatani, Noboru; Aoki, Kiyotaka; and Shimaoka, Koichi, to Ajikan Co. Ltd. Method of producing a texturized material of a marine product from surimi of the same. 4,919,959, Cl. 426-574.000.
Hosaka, Naoto: *See*—
Hosma, Tohru; Mori, Shigeki; Ohya, Kunihiko; Matsumoto, Shiro; Nakata, Akira; Abe, Ichiro; and Hosaka, Naoto, 4,918,902, Cl. 53-403.000.
Hosaka, Sumio; Amaya, Toshiyuki; Daito, Toshiji; Itoh, Hiroshi; and Jinguji, Takumi, to Pioneer Electronic Corporation. Method of recording and reproducing multi-channel information on and from recording medium. 4,920,424, Cl. 358-343.000.
Hoshi, Akio: *See*—
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Hotchkiss, Frederick H.: *See*—
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Sugita, Kazuhiko; Hotta, Shigeo; Matsuda, Osamu; and Yamakawa, Yoichi, 4,920,572, Cl. 382-48.000.
Hottle, Dwight E. Envelope. 4,919,324, Cl. 229-68.00R.
Hounsel, Mack A., to J T Thorpe Company. Attachment structure mountings for refractory fiber ladle preheater sealing rings. 4,919,398, Cl. 266-283.000.
Houston, Stepher R., to Magnaflex Associates Limited. Exercise apparatus. 4,919,419, Cl. 272-134.000.
Howard, John F.: *See*—
Timothy, Earle J.; Jackson, Edward W.; Mingrone, Joseph A.; Jolie, Jeffrey W.; Nudelman, Dennis L.; and Howard, John F., 4,919,649, Cl. 604-65.000.
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Howen, Phillip J. Holder for containers and covers. 4,919,278, Cl. 211-49.100.
Hoya Corporation: *See*—
Matsukawa, Michimasa; Izumitani, Tetsuro; and Takeuchi, Kunio, 4,919,699, Cl. 65-134.000.
Hrovat, Milan: *See*—
Konigs, Wilhelm; and Hrovat, Milan, 4,919,867, Cl. 264-57.000.
Hsieh, Yin-Fei. Multi-purpose massage shaver. 4,918,818, Cl. 30-34.050.
Hsu, Stephen M.: *See*—
Gates, Richard S.; and Hsu, Stephen M., 4,919,829, Cl. 252-25.000.
Hsu, Tsui-Chen. Reinforced junction box assembly. 4,919,292, Cl. 220-3.200.
Huang, Fu-chi; Galemmo, Robert A., Jr.; and Campbell, Henry F., to Rorer Pharamceutical Corp. Quinoline derivatives and use thereof as antagonists of leukotriene D_4. 4,920,130, Cl. 514-311.000.
Huang, Fu-Chi; Galemmo, Robert A., Jr.; and Campbell, Henry F., to Rorer Pharmaceutical Corp. Quinoline derivatives and use thereof as antagonists of leukotriene D_4. 4,920,131, Cl. 514-311.000.
Huang, Fu-chi; Galemmo, Robert A., Jr.; and Campbell, Henry F., to Rorer Pharmaceutical Corp. Quinoline derivatives and use thereof as antagonists of leukotriene D_4. 4,920,132, Cl. 514-314.000.
Huang, Fu-chi; Galemmo, Robert A., Jr.; and Campbell, Henry F., to Rorer Pharmaceutical Corp. Quinoline derivatives and use thereof as antagonists of leukotriene D_4. 4,920,133, Cl. 514-314.000.
Huang, Jow-Lay, to Champion Spark Plug Company. Production and sintering of reaction bonded silicon nitride composites containing silicon carbide whiskers or silicon nitride powders. 4,919,868, Cl. 264-65.000.
Huang, Tracy J.: *See*—
Chen, Nai Y.; Garwood, William E.; Huang, Tracy J.; Le, Quang N.; and Wong, Stephen S., 4,919,788, Cl. 208-59.000.
Hubelbank, Mark; and Shadmon, David, to CardioData Inc. Apparatus and method for solid state storage of episodic signals. 4,920,489, Cl. 364-413.060.
Huber, Leonhard; Nagel, Erich; Payrhammer, Bernd; Lermann, Peter; Treiber, Helmut; and Wilsch, Herbert, to Agfa-Gevaert Aktiengesellschaft. Apparatus for replacing rolls of customer films in copying machines. 4,919,354, Cl. 242-67.30R.
Huber, Peter: *See*—
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Hudon, James D.; and Bloyce, Lionel T., to Albany International Corp. Shower pipes. 4,919,336, Cl. 239-11.000.
Huebschen, David A., to Snap-on Tools Corporation. Spring-loaded magnetic driver and method of assembly thereof. 4,919,020, Cl. 81-125.000.
Huels Aktiengesellschaft: *See*—
Bartz, Wilfried, 4,920,174, Cl. 525-66.000.
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Hughson, David R. Method of gauging pre-existing in-situ stress from an extracted sample. 4,918,993, Cl. 73-801.000.
Huh, Billy K.; and Yan, Tsoung Y., to Mobil Oil Corporation. Clarification of slurry oil. 4,919,792, Cl. 208-99.000.
Hui, Henry K.: *See*—
Yafuso, Masao; Hui, Henry K.; Yan, Cheng F.; and Miller, William W., 4,919,891, Cl. 422-58.000.
Hung, Paul P.: *See*—
Davis, Alan R.; and Hung, Paul P., 4,920,209, Cl. 435-235.000.
Hunger, Jurgen: *See*—
Breslow, Ronald; Brandl, Michael; Adams, Alan D.; and Hunger, Jurgen, 4,920,216, Cl. 540-110.000.
Hunicke, Raymond L.: *See*—
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Hunter Douglas International N.V.: *See*—
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Pearman, Arthur N. J.; Hunter, Gerald D.; Woessner, Michael A.; and Gilman, Robert E., 4,918,995, Cl. 73-861.020.
Huntley, William P., to United States of America, Navy. Unidirectional amplitude sensitive noise riding threshold circuit. 4,920,346, Cl. 342-91.000.
Hurckes, Lisa C.: *See*—
Kamel, Ahmed; Hurckes, Lisa C.; and Morelli, Monica M., 4,919,841, Cl. 252-186.260.
Hurley, Dennis. System for draining land areas through siphoning from a permeable catch basin. 4,919,568, Cl. 405-43.000.
Hurst, Gregory C.: *See*—
Misic, George J.; Hurst, Gregory C.; Holland, G. Neil; Patrick, John L., III; and Orlando, Paul T., 4,920,318, Cl. 324-318.000.
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Hutton, Alexander E., Jr.; Burke, Richard E.; and Wheeler, Stanley P., Jr., to Monadnock Paper Mills, Inc. Water-resistant, water-flushable paper compositions. 4,920,171, Cl. 524-446.000.
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Hybos Mfg. Inc.: *See*—
McKinney, Gary S., 4,919,435, Cl. 273-339.000.
Hydro Systems, Inc.: *See*—
Carnahan, Robert P.; and Murphy, Robert J., 4,919,814, Cl. 210-603.000.
Hyman, Roger L. Eyeglass assembly. 4,919,530, Cl. 351-85.000.
Hyuga, Takao: *See*—
Washo, Junichi; Terashima, Shigeo; Deguchi, Toshihisa; Horii, Masahiro; Hyuga, Takao; and Ohta, Kenji, 4,920,437, Cl. 360-99.050.
Hyun, Kwang H. Rear view mirror sunglasses. 4,919,529, Cl. 351-50.000.
Ibar, Jean-Pierre. Process of and apparatus for treating a shaped product. 4,919,870, Cl. 264-70.000.

IBP Pietzsch GmbH: *See*—
Gobel, Ewald; Maurer, Dieter; and Opitz, Rigobert, 4,920,520, Cl. 367-99.000.
Ichiki, Nobuhiko: *See*—
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Ichikoh Industries Ltd.: *See*—
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Ichimura, Kunihiro; and Kubo, Keiji, to General Director of the Agency of Industrial Science and Technology; and Daicel Chemical Industries, Ltd. Photosensitive coating emulsion for plastic films. 4,920,030, Cl. 430-270.000.
Ichioka, Hitoshi: *See*—
Nakano, Toshihiro; Sakata, Shinji; Ichioka, Hitoshi; Minagawa, Kiyohiko; and Iijima, Hideaki, 4,918,922, Cl. 60-589.000.
Ichiryu, Ken; Kanai, Takashi; Ochiai, Masami; and Ichiki, Nobuhiko, to Hitachi Construction Machinery Co., Ltd. Solenoid operated valve apparatus. 4,919,390, Cl. 251-129.150.
Idemitsu Kosan Company Limited: *See*—
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Shibata, Mitsuru; Hiramatsu, Yoshiyuki; Adachi, Ryoichi; and Mitsutake, Kenichiro, 4,919,705, Cl. 71-90.000.
Idemitsu Petrochemical Company Limited: *See*—
Shirota, Daigo; Omori, Masao; Yamato, Hiroyasu; and Ogata, Norio, 4,919,911, Cl. 423-499.000.
Ido, Nobuhiko: *See*—
Sasaki, Ryoichi; Nakamura, Tsutomu; Suzuki, Michio; Shinnai, Kohsuke; Ido, Nobuhiko; and Tsunoda, Tomoaki, 4,920,529, Cl. 370-16.000.
Igaki, Hiroyuki: *See*—
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Iguchi, Kazuo; Soejima, Tetsuo; Murano, Kazuo; Amemiya, Shigeo; Komine, Hiroaki; Watanabe, Toshiaki; and Shinomiya, Tomohiro, to Fujitsu Limited. Frame synchronizing apparatus. 4,920,546, Cl. 375-106.000.
Iguchi, Kazuo: *See*—
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Iida, Setsuko: *See*—
Maruhashi, Yoshitsugu; Asai, Tamio; Iida, Setsuko; and Hirata, Sadao, 4,919,984, Cl. 428-36.400.
Iijima, Hideaki: *See*—
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Watanabe, Yosuke; Kawakami, Yuji; Kikuchi, Koichiro; Ogawa, Yoshiyuki; and Sato, Hiroshi, 4,919,926, Cl. 424-81.000.
Ikeda Bussan Co., Ltd.: *See*—
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Ikeda, Mitsusuke: *See*—
Yukami, Noboru; Ikeda, Mitsusuke; Ohno, Masaharu; and Nisihtani, Mikihiko, 4,920,394, Cl. 357-30.000.
Ikegami, Kazunori. Automatic impact driver. 4,919,216, Cl. 173-93.600.
Ikenoue, Yutaka: *See*—
Abe, Makoto; Tanimoto, Ichiro; Fujiki, Akira; Suzuki, Keitaro; Endo, Hiroyuki; and Ikenoue, Yutaka, 4,919,719, Cl. 75-243.000.
Iketani, Kohei, to Asahi Kogaku Kogyo Kabushiki Kaisha. Electric power source used to charge a secondary power source. 4,920,307, Cl. 320-28.000.
Ikeuchi, Horoji; and Ikeuchi, Kiyoaki, to Kabushiki Kaisha Ikeuchi Tekkosho. Method for making shrimp-shaped food products. 4,919,957, Cl. 426-513.000.
Ikeuchi, Kiyoaki: *See*—
Ikeuchi, Horoji; and Ikeuchi, Kiyoaki, 4,919,957, Cl. 426-513.000.
Ikuta, Yoshiaki; Moriwaki, Masayuki; and Kaneko, Masato, to Mitsubishi Jukogyo Kabushiki Kaisha. Method for drawing up special crude oil. 4,919,207, Cl. 166-267.000.
Iliff, Robert J.: *See*—
Chen, Loren; van Buskirk, Gregory; Peterson, David; and Iliff, Robert J., 4,919,834, Cl. 252-90.000.
Illinois Tool Works Inc.: *See*—
Samyn, Russell H., 4,919,574, Cl. 409-219.000.
Ilmarinen, Antti; Miihkinen, Veijo; and Laapotti, Jorma, to Valmet Paper Machinery Inc. Control of detachment of a paper web from a roll using heat. 4,919,759, Cl. 162-206.000.
Imagitek: *See*—
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Imago Flama Sas di Pasquinelli Mauro & C.: *See*—
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Imai, Tetsuo: *See*—
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Imai, Tetsuya; and Takao, Hisashi, to Otsuka Kagaku Kabushiki Kaisha. Fungicidal imidazole derivatives. 4,920,142, Cl. 514-399.000.
Imamiya, Eiko: *See*—
Inoue, Keizo; Nomura, Hiroaki; and Imamiya, Eiko, 4,920,134, Cl. 544-316.000.
Imamura, Kyoji: *See*—
Kato, Takashi; Morita, Yutaka; Yamaguchi, Takeshi; Tsuge, Kazuo; Imamura, Kyoji; Kawai, Yoshio; Hasegawa, Hiroaki; and Amemori, Hiroyuki, 4,918,996, Cl. 73-861.910.
Imazeki, Yukio; and Yamaguchi, Hideo, to D-Three Co., Ltd. Trash bag with holder and disposable refill trash bag. 4,919,546, Cl. 383-33.000.
Imperial Chemical Industrices PLC: *See*—
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Imperial Chemical Industries PLC: *See*—
Blundell, David J.; Cogswell, Frederic N.; and Meakin, Peter J., 4,919,992, Cl. 428-131.000.
Chattopadhyay, Arun K., 4,919,179, Cl. 149-2.000.
Dewar, Colin A.; and Artus, Kevin J., 4,919,996, Cl. 428-221.000.
Hann, Richard A.; Holmes, David R.; and Smith, John W., 4,920,193, Cl. 528-171.000.
Newton, Thomas H.; and Shimoda, Tatsuya, 4,919,858, Cl. 264-24.000.
Vadgama, Pankaj M.; and Tang, Lian X., 4,919,767, Cl. 204-153.100.
Impresa Costruzioni Soc. Fra.Sa. a r.l.: *See*—
Salabe, Mario; and Rossi, Adelio, 4,919,437, Cl. 273-410.000.
Imreg, Inc.: *See*—
Gottlieb, A. Arthur; Sizemore, Robert C.; and Sinha, Sudhir K., 4,920,097, Cl. 514-2.000.
Inagaki, Yoshio: *See*—
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Ohno, Shigeru; Inagaki, Yoshio; Adachi, Keiichi; and Momoki, Yasuhito, 4,920,031, Cl. 430-522.000.
Sugiura, Saburo; Fujita, Senji; Nakata, Hiroya; Okamoto, Tetsuo; Inagaki, Yoshio; Mizuguchi, Keiichi; and Ishii, Atsushi, 4,919,714, Cl. 75-529.000.
Inanaga, Satoshi: *See*—
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Incremona, Joseph H.; and Lundeen, Richard H., to Minnesota Mining and Manufacturing Company. Dry transfer graphics article and methods of preparation and use thereof. 4,919,994, Cl. 428-141.000.
Independent Technologies, Inc.: *See*—
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Indiana Mills & Manufacturing, Inc.: *See*—
Bougher, Jerry D; Anthony, James R.; Williams, Jeffrey L.; Homeier, Ronald F.; and Lortz, Allan R., 4,919,484, Cl. 297-474.000.
Industria Plastica Ramos S.A.: *See*—
Ongari, Rua H., 4,919,552, Cl. 384-492.000.
Industrial Technology Research Institute: *See*—
Shyu, Jia-Ming; and Chang, Chih-Li, 4,919,224, Cl. 180-168.000.
Ingalsbe, Daryl E., to Independent Technologies, Inc. Compact telephone line test apparatus. 4,920,555, Cl. 379-21.000.
Ingersoll-Rand Company: *See*—
Ono, Akira; and Iritani, Toshiro, 4,919,022, Cl. 81-464.000.
Ingwersen, Peter: *See*—
Bleuel, Eric P.; Ingwersen, Peter; Lickus, Leonard J.; Pellegrino, Thomas P.; Shah, Hasmukh; and Suthard, Robert A., 4,918,804, Cl. 29-33.00M.
Inmos Limited: *See*—
Yassaie, Mohamad H.; King-Smith, Anthony D.; and Dyson, Clive M., 4,920,508, Cl. 364-736.000.
Innami, Yoshiyuki: *See*—
Hayashi, Masahiko; Innami, Yoshiyuki; and Teshima, Naoto, 4,920,328, Cl. 338-21.000.
Innertsberger, Ernst; Schmidlkofer, Jakob; Huber, Peter; Burger, Willibald; and Schulze, Joachim, to Wacker-Chemie GmbH. Antifoam compositions. 4,919,843, Cl. 252-358.000.
Innocenti, Emil, Sr.; and Alward, Philander N. Rewind shell for textiles. 4,919,358, Cl. 242-68.400.
Inoue, Akimitsu: *See*—
Tsunoda, Masakazu; Inoue, Akimitsu; and Yamamoto, Tsutomu, deceased, 4,920,338, Cl. 340-825.300.
Inoue, Junichi: *See*—
Furuya, Akihiko; Kanamaru, Kouiti; and Inoue, Junichi, 4,920,478, Cl. 364-200.000.
Inoue, Kazunobu: *See*—
Kimura, Takashi; Chihara, Kenichi; Tomatsu, Masahiro; Inoue, Kazunobu; Yano, Norio; and Adachi, Osamu, 4,920,441, Cl. 360-133.000.
Inoue, Keizo; Nomura, Hiroaki; and Imamiya, Eiko, to Takeda Chemical Industries, Ltd. 2-O-pyrimidinyl glycerol derivatives. 4,920,134, Cl. 544-316.000.
Inoue, Masaru: *See*—
Ogawa, Souichi; Sugioka, Takao; and Inoue, Masaru, 4,920,011, Cl. 428-596.000.
Inoue, Michihiro: *See*—
Yamauchi, Hiroyuki; Yamada, Toshio; and Inoue, Michihiro, 4,920,517, Cl. 365-207.000.
Inoue, Nobuaki; Sasaoka, Senzo; Inagaki, Yoshio; Kojima, Tetsuro; and Yagihara, Morio, to Fuji Photo Film Co., Ltd. Silver halide photographic material and method for forming super high contrast negative images therewith. 4,920,029, Cl. 430-264.000.
Inoue, Nobuaki: *See*—
Sasaoka, Senzo; and Inoue, Nobuaki, 4,920,034, Cl. 430-264.000.

Inoue Seisakusho (Mfg) Co., Ltd.: *See*—
Kamiwano, Mitsuo; and Inoue, Yoshitaka, 4,919,347, Cl. 241-65.000.
Inoue, Yasuo; and Endo, Itaru, to Olympus Optical Co., Ltd. Method for micromanipulating cells by moving cell-containing vessel on stage of inverted microscope while pricking cells with tip of stylus. 4,920,053, Cl. 435-240.100.
Inoue, Yoshitaka: *See*—
Kamiwano, Mitsuo; and Inoue, Yoshitaka, 4,919,347, Cl. 241-65.000.
Inouye, Yoshinori; Ueda, Minoru; and Yotsuzuka, Kosuke, to Toray Industries, Inc. Multicolor printing press. 4,919,047, Cl. 101-175.000.
Institute fur Diabetestechnologie Gemeinnutzige Forschungs- und Entwicklungsgesellschaft mbH: *See*—
Zier, Horst D.; Kerner, Wolfgang; and Pfeiffer, Ernst F., 4,919,141, Cl. 128-635.000.
Institute Municipal D'Assistencia Sanitaria: *See*—
Badia, Marcelo S., 4,919,658, Cl. 604-265.000.
InstruMed, Inc.: *See*—
Spence, Jerry L., 4,919,888, Cl. 422-26.000.
Intellicall, Inc.: *See*—
Hird, John A.; Owen, Lindsey D.; and Rice, Michael R., 4,920,558, Cl. 379-67.000.
Hird, John A.; Owen, Lindsey D.; and Rice, Michael R., 4,920,562, Cl. 379-132.000.
Inter Innovation LeFebure Manufacturing Corp.: *See*—
Fee, Kevin A.; and Hollinrake, Mark S., 4,918,900, Cl. 52-811.000.
Interamerican Industrial Company: *See*—
Andrews, George F., 4,920,335, Cl. 340-572.000.
Interlock Corporation: *See*—
Mobley, Dewey F.; Peterson, Robert G., Sr.; and Mergless, James E., 4,919,628, Cl. 439-858.000.
Intermedics, Inc.: *See*—
Phillips, Richard E., Jr.; and Spehr, Paul R., 4,919,135, Cl. 128-419.00P.
Intermedics Orthopedics, Inc.: *See*—
Dale, James L.; Burkinshaw, Brain D.; and Burkhead, Wayne Z., 4,919,670, Cl. 623-19.000.
International Business Machines: *See*—
Jaffe, Robert S.; Lavin, Mark A.; Rand, Rick A.; and Schreiner, Paul, 4,920,429, Cl. 358-471.000.
International Business Machines Corporation: *See*—
Bausmith, Robert C.; Cote, William J.; Cronin, John E.; Holland, Karey L.; Kaanta, Carter W.; Lee, Pei-Ing P.; and Wright, Terrance M., 4,919,750, Cl. 156-643.000.
Chan, Joni N.; and Moy, Andrew, 4,920,538, Cl. 371-19.000.
Chen, Chengjun J., 4,919,971, Cl. 427-98.000.
Chin, Daeje; and Dhong, Sang H., 4,920,065, Cl. 437-52.000.
Cook, William P., 4,920,383, Cl. 355-311.000.
Eardley, Richard A.; Keenan, Brian J.; Lawson, Ian A.; and McAllister, John, 4,920,237, Cl. 200-5.00A.
Elmgren, Peter J.; Emerick, Alan J.; Rivenburg, Dennis L., Sr.; Saraiya, Mukund K.; and Sissenstein, David W., Jr., 4,919,729, Cl. 148-24.000.
Fink, Hans-Werner; Morin, Roger; Schmid, Heinz; and Stocker, Werner, 4,919,780, Cl. 204-192.340.
Fossum, Eric R.; Kirchner, Peter D.; Pettit, George D.; Warren, Alan C.; and Woodall, Jerry M., 4,920,069, Cl. 437-90.000.
Hoebener, Karl G.; and Stankus, John J., 4,919,970, Cl. 427-96.000.
Lutz, David L.; Meranda, Keith W.; and Minter, Russell B., 4,919,076, Cl. 118-721.000.
Ruane, Robert E., 4,918,812, Cl. 29-846.000.
International Marketing, Inc.: *See*—
Fogal, Robert D., Sr., 4,918,976, Cl. 73-40.700.
International Navigation, Inc.: *See*—
Farrar, James G., 4,918,824, Cl. 33-361.000.
International Paper Company: *See*—
Wagle, Dinkar G.; and Yasnovsky, Vacheslav M., 4,919,758, Cl. 162-175.000.
Interasystems, Inc.: *See*—
Wenshau, Hugo; and Rice, Grant G., 4,918,999, Cl. 73-863.540.
Irie, Yoshio; Iwasaki, Kaoru; Hatsuda, Takumi; Kimura, Kazumasa; Harada, Nobuyuki; Ishizaki, Kunihiko; Shimomura, Tadao; and Fujiwara, Teruaki, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Method for production of hydrophilic polymer from hydrated gel polymer. 4,920,202, Cl. 528-500.000.
Iritani, Toshiro: *See*—
Ono, Akira; and Iritani, Toshiro, 4,919,022, Cl. 81-464.000.
Irokawa, Sigenobu: *See*—
Okubo, Toshimitsu; Kobayashi, Kazuyoshi; Ohmura, Kohki; Sai, Yoshinobe; Satoh, Takuo; Yoshino, Yukihiko; Hoshi. Nobuyuki; Onodera, Takayuki; Endoh, Yasuo; Irokawa, Sigenobu; and Sannohe, Toshiaki, 4,919,045, Cl. 101-142.000.
Isaacson, David, to Rensselaer Polytechnic Institute. Process and apparatus for distinguishing conductivities by electric current computed tomography. 4,920,490, Cl. 364-413.130.
Ishibashi, Takanobu: *See*—
Nakakuki, Noboru; Oda, Kazuhide; Tagami, Masatoshi; Okino, Kouichi; Abe, Tomiya; and Ishibashi, Takanobu, 4,919,513, Cl. 350-96.330.
Ishida, Toshinobu: *See*—
Kousai, Tadashi; Moriuchi, Yousuke; and Ishida, Toshinobu, 4,919,605, Cl. 425-467.000.
Ishigaki, Eiichi, to Ishigaki Kiko Co., Ltd. Method and apparatus for electrolytic treatment of sludge. 4,919,775, Cl. 204-149.000.
Ishigaki Kiko Co., Ltd.: *See*—
Ishigaki, Eiichi, 4,919,775, Cl. 204-149.000.
Ishigaki, Yukio; and Sonobe, Tadasi, to Hitachi, Ltd. Superconducting energy storage device. 4,920,095, Cl. 505-1.000.
Ishiguro, Katsusuke, to Paloma Kogyo Kabushiki Kaisha. Pulse combustion apparatus. 4,919,085, Cl. 122-24.000.
Ishiguro, Kazuyoshi; Yamashita, Tatsuo; and Matsui, Kenji, to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Automatic seat belt device. 4,919,451, Cl. 280-804.000.
Ishiguro, Takashi: *See*—
Arai, Yuji; Hamada, Emiko; Shin, Yuaki; and Ishiguro, Takashi, 4,920,359, Cl. 346-137.000.
Ishiguro, Yuji; Hosokawa, Hiroyuki; Koyama, Nobuhiko; Hiramatsu, Eiji; Takao, Mitsunori; Abe, Tomoaki; Kiyono, Masashi; Maeda, Katsuya; and Kamio, Shigeru, to Nippondenso Co., Ltd. Device for controlling evaporative emission from a fuel tank. 4,919,103, Cl. 123-514.000.
Ishii, Atsushi: *See*—
Sugiura, Saburo; Fujita, Senji; Nakata, Hiroya; Okamoto, Tetsuo; Inagaki, Yoshio; Mizuguchi, Keiichi; and Ishii, Atsushi, 4,919,714, Cl. 75-529.000.
Ishii, Keizou: *See*—
Kanda, Kazunori; Ishikura, Shinichi; Ishii, Keizou; and Kashihara, Akio, 4,920,175, Cl. 525-110.000.
Ishii, Satoru: *See*—
Aiki, Kunio; Sasayama, Atsushi; Nemoto, Tugio; Haneda, Makoto; Ishii, Satoru; Kugimiya, Haruo; and Kawasaki, Tutomu, 4,920,262, Cl. 250-227.110.
Ishijima, Toshiyuki, to NEC Corporation. Structure of complementary field effect transistor. 4,920,397, Cl. 357-42.000.
Ishikawa, Katsukiyo: *See*—
Kashihara, Akio; Otsuka, Chikayuki; and Ishikawa, Katsukiyo, 4,920,187, Cl. 526-193.000.
Ishikawa, Norio: *See*—
Taniguchi, Nobuyuki; Ishimura, Toshihiko; Ishikawa, Norio; Seki, Reiji; and Akada, Yasuaki, 4,920,370, Cl. 354-402.000.
Ishikawa, Takatoshi: *See*—
Ohki, Nobutaka; Andoh, Kazuto; and Ishikawa, Takatoshi, 4,920,041, Cl. 430-380.000.
Ishikura, Shinichi: *See*—
Kanda, Kazunori; Ishikura, Shinichi; Ishii, Keizou; and Kashihara, Akio, 4,920,175, Cl. 525-110.000.
Ishimura, Toshihiko: *See*—
Taniguchi, Nobuyuki; Ishimura, Toshihiko; Ishikawa, Norio; Seki, Reiji; and Akada, Yasuaki, 4,920,370, Cl. 354-402.000.
Ishinaga, Nobuyuki, to Aida Engineering, Ltd. Fully enclosed die forging apparatus. 4,918,967, Cl. 72-354.000.
Ishinaga, Nobuyuki, to Aida Engineering, Ltd. Fully enclosed die forging apparatus. 4,918,970, Cl. 72-354.000.
Ishiyama, Tatsuro: *See*—
Tabata, Toshiyuki; and Ishiyama, Tatsuro, 4,919,400, Cl. 267-140.100.
Ishiyama, Yoshihiko: *See*—
Umekawa, Akihiko; and Ishiyama, Yoshihiko, 4,919,526, Cl. 350-604.000.
Ishizaka, Masuo: *See*—
Takahashi, Yasuhiko; Tamura, Kunimitsu; Niimura, Nagato; Asao, Keizo; Honoki, Teruyosi; Masui, Tadaaki; and Ishizaka, Masuo, 4,918,977, Cl. 73-40.50R.
Ishizaki, Kunihiko: *See*—
Irie, Yoshio; Iwasaki, Kaoru; Hatsuda, Takumi; Kimura, Kazumasa; Harada, Nobuyuki; Ishizaki, Kunihiko; Shimomura, Tadao; and Fujiwara, Teruaki, 4,920,202, Cl. 528-500.000.
Isobe, Ikuo: *See*—
Hanaoka, Tadashi; Kondo, Yoshimi; and Isobe, Ikuo, 4,920,150, Cl. 514-474.000.
Isogawa, Atsushi; and Sumigawa, Yukio, to Sanshin Kogyo Kabushiki Kaisha. Steering device for marine propulsion. 4,919,629, Cl. 440-62.000.
Isono, Kesao: *See*—
Ogiwara, Takashi; Isono, Kesao; and Katagiri, Masahide, 4,919,001, Cl. 74-10.520.
Isono, Koichi; Towohisa, Kunio; Oka, Junichi; and Sakamoto, Takashi, to Dainippon Screen Mfg. Co., Ltd. Method of and apparatus for jitter correction of a polygon mirror in an image recording apparatus. 4,920,430, Cl. 358-481.000.
Isono, Osamu; Nishino, Tetsuo; and Iwabuchi, Eisuke, to Fujitsu Limited. Header driven packet switching system and method. 4,920,531, Cl. 370-60.000.
Isowa, Eiichi; Kawai, Hideshi; Kajita, Harumi; and Matsui, Hiroki, to Isowa Industry Co., Ltd. Cardboard web feeding device for corrugator. 4,919,353, Cl. 242-58.600.
Isowa Industry Co., Ltd.: *See*—
Isowa, Eiichi; Kawai, Hideshi; Kajita, Harumi; and Matsui, Hiroki, 4,919,353, Cl. 242-58.600.
Isozaki, Hiromi; and Ito, Masakazu, to NCR Corporation. Door operating mechanism for business machines. 4,919,058, Cl. 109-24.100.
Itani, Hiromichi: *See*—
Shiokawa, Youichi; Nagano, Masanobu; and Itani, Hiromichi, 4,920,129, Cl. 514-300.000.
Ito, Atsushi; Kumazawa, Satoru; Sato, Nobuo; and Saishoji, Toshihide, to Kureha Kagaku Kogyo Kabushiki Kaishi. 2(4-chlorobenzyl)1(1H-1,2,4-triazol-1-yl-methyl-1-cycloheptanol and ' cyclohexanol. 4,920,138, Cl. 514-383.000.
Ito, Kenji, to Kabushiki Kaisha Toshiba. Rotary recording/playback head angular position correction apparatus. 4,920,433, Cl. 360-64.000.

Ito, Koreshige: *See*—
Iwakura, Ken; Sano, Shojiro; Satomura, Masato; Ito, Koreshige; and Matsuoka, Katsumi, 4,920,091, Cl. 503-211.000.

Ito, Masahiro; and Endo, Satoru, to Hitachi, Ltd. Method of fabricating electrode of color picture tube electron gun. 4,919,634, Cl. 445-49.000.

Ito, Masakazu: *See*—
Isozaki, Hiromi; and Ito, Masakazu, 4,919,058, Cl. 109-24.100.

Ito, Masazumi; and Murata, Tomoji, to Minolta Camera Kabushiki Kaisha. Copying apparatus capable of automatically selecting copy paper size and control method for controlling operation of copying apparatus. 4,920,377, Cl. 355-55.000.

Itoh, Hajime; Takahashi, Hiroshi; Ohbori, Kouji; and Habara, Hideaki, to Mitsubishi Rayon Co., Ltd. Porous membrane. 4,919,810, Cl. 210-500.340.

Itoh, Hiroshi: *See*—
Hosaka, Sumio; Amaya, Toshiyuki; Daito, Toshiji; Itoh, Hiroshi; and Jinguji, Takumi, 4,920,424, Cl. 358-343.000.

Itoh, Masahiro, to Oki Electric Industry Co., Ltd. Memory call array structure and process for producing the same. 4,920,389, Cl. 357-23.600.

Itoh, Shinichi; and Shigekane, Hisao, to Fuji Electric Co., Ltd. Overcurrent limiting semiconductor device. 4,920,405, Cl. 357-74.000.

Itoh, Takehiko: *See*—
Yamaguchi, Kiichi; and Itoh, Takehiko, 4,919,620, Cl. 439-15.000.

Itoh, Yuji, to Canon Kabushiki Kaisha. Particle measuring device with elliptically-shaped scanning beam. 4,920,275, Cl. 250-574.000.

ITT Corporation: *See*—
Anhalt, John W.; and Goodman, David S., 4,919,626, Cl. 439-260.000.

Ittemann, Peter: *See*—
Winkler, Matthias; Ittemann, Peter; and Matthies, Hans G., 4,919,978, Cl. 427-381.000.

Iveco Fiat S.p.A.: *See*—
Santini, Franco, 4,919,404, Cl. 267-260.000.

Iwabuchi, Eisuke: *See*—
Isono, Osamu; Nishino, Tetsuo; and Iwabuchi, Eisuke, 4,920,531, Cl. 370-60.000.

Iwabuchi, Hideo, to Jidosha Kiki Co., Ltd. Fuel pump driving apparatus for vehicle. 4,919,102, Cl. 123-499.000.

Iwahara, Yoshiaki: *See*—
Ogino, Masanori; Kaiwa, Hiroshi; Iwahara, Yoshiaki; Tamura, Yuzo; and Yamamoto, Akio, 4,919,518, Cl. 350-128.000.

Iwai, Tsunehiko: *See*—
Nakama, Yasunari; Harusawa, Fuminori; Otsubo, Kyoko; Iwai, Tsunehiko; Tamaki, Shuya; and Ohkoshi, Masahiro, 4,919,846, Cl. 252-542.000.

Iwakura, Ken; Sano, Shojiro; Satomura, Masato; Ito, Koreshige; and Matsuoka, Katsumi, to Fuji Photo Film Co., Ltd. Recording material. 4,920,091, Cl. 503-211.000.

Iwanami, Takefumi; Maruta, Kiyoshi; Murota, Ichiya; and Miyazaki, Hiroshi, to Calpis Food Industry Co., Ltd., The. Feeds. 4,919,936, Cl. 424-442.000.

Iwasaki, Kaoru: *See*—
Irie, Yoshio; Iwasaki, Kaoru; Hatsuda, Takumi; Kimura, Kazumasa; Harada, Nobuyuki; Ishizaki, Kunihiko; Shimomura, Tadao; and Fujiwara, Teruaki, 4,920,202, Cl. 528-500.000.

Iwasaki, Yoshihisa; and Akamatsu, Shogo, to Maeda Industries, Ltd. Support structure for bicycle saddle. 4,919,378, Cl. 248-295.100.

Iwase, Nobuo: *See*—
Iyogi, Kiyoshi; Yasumoto, Takaaki; Yanazawa, Toshirou; Iwase, Nobuo; Nakahashi, Masako; and Takeda, Hiromitsu, 4,919,731, Cl. 148-24.000.

Iyogi, Kiyoshi; Yasumoto, Takaaki; Yanazawa, Toshirou; Iwase, Nobuo; Nakahashi, Masako; and Takeda, Hiromitsu, to Kabushiki Kaisha Toshiba. Brazing paste. 4,919,731, Cl. 148-24.000.

Izu, Genichi: *See*—
Aouda, Yukio; Ninomiya, Hiroshi; Izu, Genichi; Yazawa, Yuichi; and Tachibana, Megumi, 4,919,919, Cl. 424-45.000.

Izumitani, Tetsuro: *See*—
Matsukawa, Michimasa; Izumitani, Tetsuro; and Takeuchi, Kunio, 4,919,699, Cl. 65-134.000.

Izuwa, Akio: *See*—
Higashi, Tsuneo; and Izuwa, Akio, 4,919,696, Cl. 55-269.000.

J. M. Voith GmbH: *See*—
Schiel, Christian; Flamig, Hans; and Schutte, Andreas, 4,919,761, Cl. 162-358.000.

J - MARK Industries: *See*—
Julian, Marland R., 4,919,374, Cl. 248-95.000.

J. N. Fauver Comany, Inc.: *See*—
Riley, Ron J., 4,919,057, Cl. 104-295.000.

J T Thorpe Company: *See*—
Hounsel, Mack A., 4,919,398, Cl. 266-283.000.

Jackson, Edward W.: *See*—
Timothy, Earle J.; Jackson, Edward W.; Mingrone, Joseph A.; Jolie, Jeffrey W.; Nudelman, Dennis L.; and Howard, John F., 4,919,649, Cl. 604-65.000.

Jackson, James E.; and Wardlow, Denis, to Allsop, Inc. Cross country ski. 4,919,447, Cl. 280-604.000.

Jackson, Jerry D.; and Youngblood, Terry D. Filter base for forced air furnace. 4,919,123, Cl. 126-110.00R.

Jacobacci-Casetta & Perani: *See*—
Drocco, Amabile, 4,919,539, Cl. 366-94.000.

Jacquet, Joel: *See*—
Brosson, Philippe; Jacquet, Joel; Artigue, Claude; Leclerc, Denis; and Benoit, Jacques, 4,920,542, Cl. 372-50.000.

Jacuzzi Whirlpool Bath: *See*—
DeSousa, Daniel A.; Badley, William G.; and D'Innocente, Ralph, 4,918,768, Cl. 4-542.000.

Jaeger, Helmut: *See*—
Schulz, Guenther; Druschke, Wolfgang; and Jaeger, Helmut, 4,920,157, Cl. 522-96.000.

Jaffe, Robert S.; Lavin, Mark A.; Rand, Rick A.; and Schreiner, Paul, to International Business Machines. Exposure compensation for a line scan camera. 4,920,429, Cl. 358-471.000.

Jahnke, Earl M.: *See*—
Uecker, William F.; Jahnke, Earl M.; and Hughes, Kenneth, 4,919,186, Cl. 160-321.000.

Jahoda, Colin A. B.: *See*—
Oliver, Roy F.; and Jahoda, Colin A. B., 4,919,664, Cl. 623-15.000.

Jakob, Wolfgang; Tresper, Erhard; and Alewelt, Wolfgang, to Bayer Aktiengesellschaft. Isolation of purified solid polyarylene sulfide directly from polymerization solution. 4,920,201, Cl. 528-486.000.

Jakobs, Udo: *See*—
Donath, Sabine; Grund, Peter; Holz, Peter; Jakobs, Udo; and Volker, Wolfgang, 4,918,876, Cl. 51-426.000.

Jaks, Otto J.: *See*—
Hokbrook, James G.; and Jaks, Otto J., 4,920,315, Cl. 324-313.000.

James C. Barber and Associates, Inc.: *See*—
Barber, James C., 4,919,906, Cl. 423-323.000.

James, David R., to James Industries Limited. Patient lifting and hoist therefor. 4,918,771, Cl. 5-81.00R.

James Industries Limited: *See*—
James, David R., 4,918,771, Cl. 5-81.00R.

James, Leslie: *See*—
Smith, James W.; Barton, Robert A.; and Knight, Cyril H., deceased, 4,919,914, Cl. 423-576.200.

James River Corporation: *See*—
Kuchenbecker, Morris W., 4,919,271, Cl. 206-611.000.

Jamet, Michel R.: *See*—
Murray, Charles N.; and Jamet, Michel R., 4,919,065, Cl. 114-312.000.

Janicek, Alan J.: *See*—
Allard, John J.; Kemp, Merle L.; and Janicek, Alan J., 4,918,833, Cl. 29-621.100.

Jansen, Franz; and Gros, Pierre, to Sanofi. Conjugates in which a monovalent carboxylic ionophore is associated by means of a covalent bond with a macromolecule, their use as immunotoxin potentiators and the intermediate activated ionophores. 4,919,928, Cl. 424-85.910.

Jansen, Franz: *See*—
Casellas, Pierre; Gros, Pierre; and Jansen, Franz, 4,919,927, Cl. 424-85.910.

Janssen, Gwen V.; and Rowland, Roy C. Hearing aid headband support. 4,918,757, Cl. 2-171.000.

Janssen Pharmaceutica N.V.: *See*—
Moeremans, Marc K. J. J.; Daneels, Guido F. T.; De Raeymaeker, Marc C.; and De Mey, Jan R., 4,920,059, Cl. 436-86.000.

Janszen, Arthur W. Apparatus for repairing windshields. 4,919,602, Cl. 425-12.000.

Japan Aircraft Mfg. Co., Ltd.: *See*—
Okazaki, Kakuma; and Kitamura, Takayuki, 4,918,884, Cl. 52-108.000.

Japan LSI Co., Ltd.: *See*—
Morioka, Osamu; Tokushige, Keizo; Kimura, Akeo; and Nihei, Takahiro, 4,918,928, Cl. 62-51.100.

Jaquet Orthopedie, S.A.: *See*—
Jonsson, Ulf; and Wagenknecht, Marcel, 4,919,119, Cl. 606-54.000.

Jarzombek, Richard E.; Moeller, Raymond J., Jr.; and Pruitt, Merrill L., to Bee Chemical Company. Water-reducible coating composition. 4,920,199, Cl. 528-272.000.

Jaster, Heinz, to General Electric Company. Refrigeration system with dual evaporators and suction line heating. 4,918,942, Cl. 62-335.000.

Jeanson, Richard L.: *See*—
Olson, John B.; Jeanson, Richard L.; and Sinchok, John D., 4,919,250, Cl. 194-248.000.

Jednotne Zemedelske Druzstvo "Vitezny Unor" Se Sidlem V Komorne: *See*—
Petran, Mojmir; and Hadravsky, Milan, 4,919,516, Cl. 350-171.000.

Jefson, Martin R.: *See*—
Holdom, Kelvin S.; Ruddock, John C.; Tone, Junsuke; Maeda, Hiroshi; and Jefson, Martin R., 4,920,215, Cl. 536-16.800.

Jeneric/Pentron Incorporated: *See*—
Brodersen, Craig, 4,919,191, Cl. 164-495.000.

Jensen Engineering: *See*—
Franks, Joseph K., 4,919,021, Cl. 81-426.500.

Jensen, Hans C. S.; and Pedersen, Henning, to Tulip Slagterierne A.M.B.A. Method for the heat curing of raw meat products. 4,919,951, Cl. 426-241.000.

Jensen, Thomas H., to PPG Industries, Inc. Metering apparatus and method for the measurement of a fixed length of continuous yarn or strand. 4,920,274, Cl. 250-561.000.

Jeruzal, Thomas M., to Chrysler Motors Corporation. Shipping rack including dunnage bar locking mechanism. 4,919,277, Cl. 211-41.000.

Jidosha Denki Kogyo Kabushiki Kaisha: *See*—
Saito, Yasujiro, 4,920,289, Cl. 310-90.000.

Jidosha Kiki Co., Ltd.: *See*—
Iwabuchi, Hideo, 4,919,102, Cl. 123-499.000.

Jinguji, Takumi: *See*—
Hosaka, Sumio; Amaya, Toshiyuki; Daito, Toshiji; Itoh, Hiroshi; and Jinguji, Takumi, 4,920,424, Cl. 358-343.000.

Johansson, Arne, to ABU Garcia Producktion AB. Fishing reel of the multiplier type. 4,919,362, Cl. 242-303.000.

Johansson, Mikael: *See*—
Rydstrom, Sven-Olof; and Johansson, Mikael, 4,919,321, Cl. 227-69.000.

John, Helmut; and Herrmann, Otfrid, to Messerschmitt-Boelkow-Blohm GmbH. Propulsion system for hypersonic flight. 4,919,364, Cl. 244-55.000.

Johnson, Alan A.: *See*—
Barry, David L.; Dreher, Mark L.; Johnson, Alan A.; and Schroeder, Otto E., 4,919,947, Cl. 426-94.000.

Johnson, Bruce G.: *See*—
Johnson, Louis W.; and Johnson, Bruce G., 4,919,348, Cl. 241-215.000.
Johnson, Louis W.; and Johnson, Bruce G., 4,919,349, Cl. 241-215.000.

Johnson, Dannis R.: *See*—
Gustafson, Alan D.; Naley, Lowell B.; Christiansen, David A.; Holum, Stanley O.; Harrington, Robert L.; Johnson, Dannis R.; and Truckenbrod, Gregory R., 4,918,932, Cl. 62-89.000.

Johnson, David A., to Hewlett-Packard Company. Unattended replacement of plotter pens. 4,920,357, Cl. 346-49.000.

Johnson, Donald A.: *See*—
Fong, Dodd W.; Hoots, John E.; Johnson, Donald A.; and Kneller, James, 4,919,821, Cl. 210-698.000.

Johnson, Donald C.; and Neogi, Amar N., to Weyerhaeuser Company. Nonwoven fabric-like product using a bacterial cellulose binder and method for its preparation. 4,919,753, Cl. 162-116.000.

Johnson, Eric T.: *See*—
Doty, Gerald A.; and Johnson, Eric T., 4,919,450, Cl. 280-803.000.

Johnson, Louis W.; and Johnson, Bruce G. Dust seal for gyratory rock crushers. 4,919,348, Cl. 241-215.000.

Johnson, Louis W.; and Johnson, Bruce G. Dust seal for gyratory rock crushers. 4,919,349, Cl. 241-215.000.

Johnson, Michael R.: *See*—
Eggler, James F.; Johnson, Michael R.; and Melvin, Lawrence S., Jr., 4,920,221, Cl. 544-125.000.

Johnson, Robert C.: *See*—
Cotter, Richard; Johnson, Robert C.; Ward, Michael; Madsen, David C.; Valicenti, Anthony J.; Menard, Michael P.; and Tucker, Hugh N., 4,920,098, Cl. 514-2.000.

Johnson, Willard L. Vertical leaf filter flush. 4,919,805, Cl. 210-332.000.

Johnston, Alan G.: *See*—
Johnston, Wayne R.; and Johnston, Alan G., 4,919,743, Cl. 156-304.400.

Johnston, J. O'Neal: *See*—
Holbert, Gene W.; and Johnston, J. O'Neal, 4,920,114, Cl. 514-177.000.

Johnston, James G.: *See*—
Brazelton, Carl L.; Litherland, Troy C.; and Johnston, James G., 4,920,519, Cl. 366-161.000.

Johnston, Wayne R.; and Johnston, Alan G. Method of laying carpet to avoid seam peaking and apparatus therefor. 4,919,743, Cl. 156-304.400.

Joiner, Karen A.: *See*—
King, Francis D.; and Joiner, Karen A., 4,920,127, Cl. 514-278.000.

Jokioinen, Ilkka: *See*—
Ruottu, Reijo; Rajala, Raimo; Jokioinen, Ilkka; and Ahlskog, Sture, 4,918,828, Cl. 34-4.000.

Jolie, Jeffrey W.: *See*—
Timothy, Earle J.; Jackson, Edward W.; Mingrone, Joseph A.; Jolie, Jeffrey W.; Nudelman, Dennis L.; and Howard, John F., 4,919,649, Cl. 604-65.000.

Joly, Claude, to Bronzavia Aeronautique. Heat-insulating device comprising radiation-reflecting materials and a conduction-insulating material. 4,919,995, Cl. 428-189.000.

Jones, Benjamin P. Interactive workstation. 4,920,458, Cl. 362-33.000.

Jones, Douglas S.: *See*—
Horstmann, Dennis G.; and Jones, Douglas S., 4,920,141, Cl. 514-398.000.

Jones, Evan W., to BPMF, Inc. Method of producing a painted marble-ized finish on an exposed surface. 4,919,975, Cl. 427-260.000.

Jones, Gary V.: *See*—
Arora, Vijay K.; Jones, Gary V.; Kovtun, John M.; and Brandlein, Lawrence S., 4,919,962, Cl. 426-594.000.

Jones, Lynn A.; Smith, Lloyd H.; and Teng, Nelson N. H., to Aspen Diagnostics Corporation. Sample collection and transport fluid composition. 4,919,889, Cl. 422-40.000.

Jones, Mervyn F., to Albright & Wilson Limited. Novel dispersible active sizing composition. 4,919,725, Cl. 106-218.000.

Jones, T. Mike: *See*—
Rutledge, Woodrow T., Jr.; Rutledge, Russell P.; Jones, T. Mike; McCown, Don E.; and Hodnett, J. Tom, 4,919,550, Cl. 403-268.000.

Jones, Todd K.: *See*—
Askin, David; Jones, Todd K.; Reamer, Robert A.; Volante, Ralph P.; and Shinkai, Ichiro, 4,920,218, Cl. 540-456.000.

Jones, Winton D.; Dage, Richard C.; and Schnettler, Richard A., to Merrell Dow Pharmaceuticals Inc. Novel alkoxyimino ether derivatives of 5-acyl-2(1H)-pyridinones. 4,920,229, Cl. 546-283.000.

Jonsson, Ulf; and Wagenknecht, Marcel, to Jaquet Orthopedie, S.A. External dynamic bone fixation device. 4,919,119, Cl. 606-54.000.

Jorgensen, August H., Jr., to B. F. Goodrich Company, The. Nitrile emulsion polymers having improved adhesion properties. 4,920,176, Cl. 525-185.000.

Josefsson, Stefan E.: *See*—
Forsberg, Gunnar S.; and Josefsson, Stefan E., 4,920,545, Cl. 375-58.000.

Jost, Michael; and Weishaupt, Walter, to Bayerische Motoren Werke Aktiengesellschaft. Image-reproducing arrangement for motor vehicles including lens means forming a real image adjacent an upper edge of a windshield to which an instrument panel mirror reflects to form a virtual image. 4,919,517, Cl. 350-174.000.

Joy Technologies Inc.: *See*—
Wechner, Edward, 4,919,252, Cl. 198-494.000.

Julian, Marland R., to J - MARK Industries. Plastic liner securing apparatus. 4,919,374, Cl. 248-95.000.

Julson, Gordon F., Jr. Apparatus for cutting flexible materials. 4,919,026, Cl. 83-56.000.

Jun, Dong Soo, to Samsung Semiconductor and Telecommunications Co., Ltd. Junction-breakdown protection semiconductor device. 4,920,445, Cl. 361-91.000.

Jung, Mankil: *See*—
McChesney, James D.; and Jung, Mankil, 4,920,147, Cl. 514-450.000.

Junk, Richard A., to Sta-Rite Industries. Eyeball assembly for an eyeball fitting. 4,919,338, Cl. 239-587.000.

Juros, Karel B. F. Multi-link cutting tool. 4,918,815, Cl. 30-191.000.

Justice, David D.: *See*—
Miles, Ronald C.; Justice, David D.; and Woodard, Kenneth E., Jr., 4,919,791, Cl. 204-98.000.

Kaanta, Carter W.: *See*—
Bausmith, Robert C.; Cote, William J.; Cronin, John E.; Holland, Karey L.; Kaanta, Carter W.; Lee, Pei-Ing P.; and Wright, Terrance M., 4,919,750, Cl. 156-643.000.

Kabelmetal Electro GmbH: *See*—
Weislo, Manfred; Raschbichler, Hans G.; Miller, Luitpold; and Breitenbach, Otto, 4,918,835, Cl. 29-732.000.

Kabushiki Kaisha Daikin Seisakusho: *See*—
Koshimo, Masahiko, 4,919,241, Cl. 192-3.290.

Kabushiki Kaisha Ikeuchi Tekkosho: *See*—
Ikeuchi, Horoji; and Ikeuchi, Kiyoaki, 4,919,957, Cl. 426-513.000.

Kabushiki Kaisha Kobe Seikosho: *See*—
Morioka, Osamu; Tokushige, Keizo; Kimura, Akeo; and Nihei, Takahiro, 4,918,928, Cl. 62-51.100.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Hiraki, Hikosaburo; Murakami, Toshibumi; and Kusakabe, Akira, 4,919,093, Cl. 123-299.000.

Kabushiki Kaisha Meidensha: *See*—
Hayashi, Masahiko; Innami, Yoshiyuki; and Teshima, Naoto, 4,920,328, Cl. 338-21.000.

Kabushiki Kaisha Miyanaga: *See*—
Miyanaga, Masaaki, 4,919,579, Cl. 411-55.000.

Kabushiki Kaisha Sato: *See*—
Kikuchi, Hidenori, 4,919,555, Cl. 400-224.200.

Kabushiki Kaisha Tobi: *See*—
Motoda, Shingo, 4,918,776, Cl. 12-142.00F.

Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho: *See*—
Ishiguro, Kazuyoshi; Yamashita, Tatsuo; and Matsui, Kenji, 4,919,451, Cl. 280-804.000.
Kimura, Takashi; and Mori, Mitsuo, 4,918,955, Cl. 70-277.000.

Kabushiki Kaisha Toshiba: *See*—
Aoki, Masayuki, 4,920,246, Cl. 219-10.55B.
Aoki, Shigeo, 4,920,514, Cl. 364-521.000.
Furuya, Akihiko; Kanamaru, Kouiti; and Inoue, Junichi, 4,920,478, Cl. 364-200.000.
Hirata, Yoshihiro, 4,920,427, Cl. 358-437.000.
Ito, Kenji, 4,920,433, Cl. 360-64.000.
Iyogi, Kiyoshi; Yasumoto, Takaaki; Yanazawa, Toshirou; Iwase, Nobuo; Nakahashi, Masako; and Takeda, Hiromitsu, 4,919,731, Cl. 148-24.000.
Kageyama, Kenichi, 4,920,560, Cl. 379-100.000.
Maruyama, Ryoji, 4,920,312, Cl. 324-141.000.
Matsuo, Yukito, 4,919,054, Cl. 104-94.000.
Muraoka, Hiroaki; and Miyashita, Toshiyuki, 4,920,282, Cl. 307-442.000.
Ochiai, Kumi; Horie, Hiromichi; Arima, Itsuo; and Morita, Mikio, 4,919,734, Cl. 148-306.000.
Sakamoto, Noriaki, 4,918,936, Cl. 62-117.000.
Sakamoto, Yutaka; and Kamaga, Ryuichi, 4,919,113, Cl. 128-4.000.
Satoh, Kozo, 4,920,314, Cl. 324-312.000.
Takahashi, Hiroshi; and Takahara, Kenichi, 4,920,551, Cl. 378-125.000.
Takei, Tamotsu, 4,920,253, Cl. 219-506.000.
Tsunoda, Tetsujiro, 4,920,062, Cl. 437-6.000.
Umemoto, Yuji, 4,920,557, Cl. 379-61.000.
Umezawa, Toshimitu, 4,920,408, Cl. 358-31.000.
Yoshie, Tsuyoshi, 4,920,521, Cl. 367-103.000.

Kadan, Ranjit S.; and Ziegler, George M., Jr., to United States of America, Agriculture. Flan-type pudding. 4,919,958, Cl. 426-573.000.

Kadifa, Abdo G.: *See*—
Binkley, Joseph H.; Caro, Perry A.; Dillon, John B.; Fay, Charles R.; Gibbons, Jonathan; Hooks, Hilary N.; Kadifa, Abdo G.; Lee, Jeffery W.; Lynch, William C.; Mock, Clayton W.; Neely, Everett T.; Tallan, Michael L.; Thompson, Geoffrey O.; Vukkadala, Gaya; Wick, John D.; and Woods, Donald R., 4,920,481, Cl. 364-200.000.

Kadlec, John D.: *See*—
Ahmed, Salah H.; Kadlec, John D.; and Luksas, Anthony J., 4,919,960, Cl. 426-580.000.

Kadono, Yasuo; Koga, Masaaki; and Aoki, Yoshio, to Kao Corporation. Ferromagnetic metal powder. 4,920,010, Cl. 428-570.000.

Kaeriyama, Kyoji: *See*—
Nakao, Yukimichi; Kaeriyama, Kyoji; and Yamauchi, Aizo, 4,919,716, Cl. 423-658.500.

Kaes, Guenter, to Robert Bosch GmbH. Tests of electrohydraulic switching valves with fluidic ball elements. 4,919,497, Cl. 303-119.000.

Kaeser, Rudolf; and Meister, Jurg, to Schweizerische Eidgenossenschaft Vertreten Durch: Eidg. Munitionsfabrik Thun Der Gruppe Fur Rustensdienste. Process for isostatically pressing explosive charges. 4,920,079, Cl. 264-3.100.

Kageyama, Kenichi, to Kabushiki Kaisha Toshiba. Method of automatic dialing and automatic dialing device for facsimile apparatuses. 4,920,560, Cl. 379-100.000.

Kai, Hisao; and Nakashima, Kiyoshi, to Asahi Chemical Polyflex. Easily openable tightly sealed bag. 4,919,272, Cl. 206-620.000.

Kaihara, Yuji: *See*—
Horaguchi, Mitsuhiro; Tomizawa, Shigechika; and Kaihara, Yuji, 4,919,905, Cl. 423-239.000.

Kaiwa, Hiroshi: *See*—
Ogino, Masanori; Kaiwa, Hiroshi; Iwahara, Yoshiaki; Tamura, Yuzo; and Yamamoto, Akio, 4,919,518, Cl. 350-128.000.

Kajita, Harumi: *See*—
Isowa, Eiichi; Kawai, Hideshi; Kajita, Harumi; and Matsui, Hiroki, 4,919,353, Cl. 242-58.600.

Kajiwara, Toshiyuki: *See*—
Kobayashi, Kazuo; Kajiwara, Toshiyuki; Sekiya, Teruo; and Kimura, Tomoaki, 4,918,965, Cl. 72-243.000.

Kakimi, Fujio, to Fuji Photo Film Co., Ltd. Light-sensitive material containing silver halide, reducing agent and polymerizable compound. 4,920,027, Cl. 430-138.000.

Kakimoto, Norihiro; Kumano, Kazuo; and Nakamura, Kunie, to Asai Germanium Research Institute Co., Ltd. Agent for reducing nephrotoxicity caused by cyclosporin administration. 4,919,917, Cl. 424-10.000.

Kakko-Chiloff, Nicolas, to Usinage Montage et Assistance Technique "U.M.A.T." ; and Conseil Vente Service. Offset printing apparatus operating in tandem. 4,919,046, Cl. 101-143.000.

Kallinich, Dietmar; Hahlert, Wolfgang; and Thom, Peter, to Veba Kraftwerke Ruhr Aktiengesellschaft; and Flachglas Aktiengesellschaft. Flow duct for the flue gas of a flue gas-cleaning plant. 4,919,170, Cl. 138-39.000.

Kalt, Glenda G., to Kalt Medical Corporation. IV clamp with membrane. 4,919,654, Cl. 604-180.000.

Kalt Medical Corporation: *See*—
Kalt, Glenda G., 4,919,654, Cl. 604-180.000.

Kamaga, Ryuichi: *See*—
Sakamoto, Yutaka; and Kamaga, Ryuichi, 4,919,113, Cl. 128-4.000.

Kamel, Ahmed; Hurckes, Lisa C.; and Morelli, Monica M., to Lever Brothers Company. Wax encapsulated actives and emulsion process for their production. 4,919,841, Cl. 252-186.260.

Kameyama, Masatoshi: *See*—
Murakami, Tokumichi; Kamizawa, Koh; and Kameyama, Masatoshi, 4,920,480, Cl. 364-200.000.

Kamijo, Eiji: *See*—
Nogawa, Shuichi; and Kamijo, Eiji, 4,920,094, Cl. 505-1.000.

Kamimura, Masatsugu: *See*—
Endo, Seiji; Kobayashi, Osamu; and Kamimura, Masatsugu, 4,920,544, Cl. 375-26.000.

Kamimura, Takeshi; and Satoh, Toshihiro, to ASMO Co., Ltd. Washer pump for automobiles. 4,919,591, Cl. 415-152.100.

Kamio, Shigeru: *See*—
Ishiguro, Yuji; Hosokawa, Hiroyuki; Koyama, Nobuhiko; Hiramatsu, Eiji; Takao, Mitsunori; Abe, Tomoaki; Kiyono, Masashi; Maeda, Katsuya; and Kamio, Shigeru, 4,919,103, Cl. 123-514.000.

Kamiwano, Mitsuo; and Inoue, Yoshitaka, to Inoue Seisakusho (Mfg) Co., .Ltd. Dispersing and grinding apparatus. 4,919,347, Cl. 241-65.000.

Kamiya, Shin; and Ueda, Toru, to Sharp Kabushiki Kaisha. Method of distinguishing voice from noise. 4,920,568, Cl. 381-46.000.

Kamizawa, Koh: *See*—
Murakami, Tokumichi; Kamizawa, Koh; and Kameyama, Masatoshi, 4,920,480, Cl. 364-200.000.

Kan, Ada: *See*—
Rhodes, Michael L.; Kan, Ada; and Tivattanasuk, Eva, 4,920,573, Cl. 382-6.000.

Kan, Akiko, legal successor: *See*—
Arahara, Kohzoh; Fukumoto, Hiroshi; Yuasa, Toshiya; Ohnishi, Toshikazu; Kan, Fumitaka, deceased; Tanioka, Hiroshi; Koizumi, Norihiko; and Tohyama, Noboru, 4,920,361, Cl. 346-140.00R.

Kan, Fumitaka, deceased: *See*—
Arahara, Kohzoh; Fukumoto, Hiroshi; Yuasa, Toshiya; Ohnishi, Toshikazu; Kan, Fumitaka, deceased; Tanioka, Hiroshi; Koizumi, Norihiko; and Tohyama, Noboru, 4,920,361, Cl. 346-140.00R.

Kanai, Takashi: *See*—
Ichiryu, Ken; Kansi, Takashi; Ochiai, Masami; and Ichiki, Nobuhiko, 4,919,390, Cl. 251-129.150.

Kanamaru, Kouiti: *See*—
Furuya, Akihiko; Kanamaru, Kouiti; and Inoue, Junichi, 4,920,478, Cl. 364-200.000.

Kanda, Akio, to Mitsubishi Denki Kabushiki Kaisha. Squirrel-cage induction motor. 4,920,293, Cl. 310-116.000.

Kanda, Kazunori; Ishikura, Shinichi; Ishii, Keizou; and Kashihara, Akio, to Nippon Paint Co., Ltd. Microparticles having crosslinking reaction promotor function and method of use. 4,920,175, Cl. 525-110.000.

Kanda, Yohichi: *See*—
Shida, Takafumi; Arabori, Hideo; Watanabe, Takeo; Kanda, Yohichi; Yamazaki, Shiro; and Shinkawa, Hiroyasu, 4,919,707, Cl. 71-92.000.

Kanda, Yuichi: *See*—
Toyoda, Kenichi; Mizuno, Toru; Torii, Nobutoshi; Kanda, Yuichi; and Morikawa, Shigehiro, 4,920,248, Cl. 219-124.340.

Kane, Mary F.: *See*—
Olivier, James P.; Kane, Mary F.; Orr, Clyde, Jr.; Laughinghouse, Charles L.; Wagner, Jack J.; and Tidwell, Samuel V., 4,920,550, Cl. 378-51.000.

Kanebo Limited: *See*—
Sato, Takesi; Mitsuhashi, Kepichi; Tomita, Yoji; and Sasaki, Yasuoki, 4,918,872, Cl. 51-209.00R.

Kaneda, Naoya; Wada, Hiroyuki; Hirasawa, Mashide; and Suda, Hirofumi, to Canon Kabushiki Kaisha. Lens position control device. 4,920,369, Cl. 354-400.000.

Kaneko, Kiyotaka, to Fuji Photo Film Co., Ltd. Camera control device. 4,920,371, Cl. 354-410.000.

Kaneko, Masato: *See*—
Ikuta, Yoshiaki; Moriwaki, Masayuki; and Kaneko, Masato, 4,919,207, Cl. 166-267.000.

Kaneko, Nobutaka, to Olympus Optical Co., Ltd. Method of processing and analyzing electrophoretic image, and method of displaying electrophoregram and a medium for recording electrophoregram. 4,920,498, Cl. 364-497.000.

Kaneko, Takaoki: *See*—
Fukuta, Kenji; Kaneko, Takaoki; and Takahashi, Yoshinobu, 4,919,745, Cl. 156-345.000.

Kang, Sang-Suk: *See*—
Hong, Pil-Young; Oh, Tae-Yup; Kim, Chun-Joong; and Kang, Sang-Suk, 4,920,066, Cl. 437-57.000.

Kangasaho, Olavi: *See*—
Mard, Matti; Vauhkonen, Vesa; and Kangasaho, Olavi, 4,920,306, Cl. 318-722.000.

Kankare, Jouko; Takalo, Harri; and Pasanen, Paavo. Fluorescent lanthanide chelates. 4,920,195, Cl. 534-16.000.

Kano, Yoshiaki: *See*—
Sakakibara, Shiro; Miyaishi, Yoshinori; and Kano, Yoshiaki, 4,919,645, Cl. 474-245.000.

Kansai Electric Power Co., Inc.: *See*—
Kuwabara, Takao; Nakagawa, Hiroto; and Kita, Eizo, 4,920,277, Cl. 290-40.00C.

Kao Corporation: *See*—
Kadono, Yasuo; Koga, Masaaki; and Aoki, Yoshio, 4,920,010, Cl. 428-570.000.

Karbach, Stefan: *See*—
Goetz, Norbert; Karbach, Stefan; and Recker, Hans-Gert, 4,920,232, Cl. 546-338.000.

Karl Lautenschlager GmbH & Co. KG: *See*—
Horst, Lautenschlager, 4,919,548, Cl. 384-19.000.

Karlsson, Klas; and Bergvall, Rune, to NTD Hiss Nartransportdon AB. Screw lift. 4,919,236, Cl. 187-25.000.

Karpf, Kurt, to Sulzer Brothers Limited. Metal anchoring part for a knee joint endoprosthesis. 4,919,671, Cl. 623-20.000.

Karytinos, Alexandros. Building frame construction. 4,918,899, Cl. 52-690.000.

Kashihara, Akio; Otsuka, Chikayuki; and Ishikawa, Katsukiyo, to Nippon Paint Co., Ltd. Process for preparing particles having monodisperse particle size. 4,920,187, Cl. 526-193.000.

Kashihara, Akio: *See*—
Kanda, Kazunori; Ishikura, Shinichi; Ishii, Keizou; and Kashihara, Akio, 4,920,175, Cl. 525-110.000.

Kasting, Thomas: *See*—
Hoekwater, Mark A.; Paren, Anthony R.; Kasting, Thomas; and Rollins, Richard, 4,919,389, Cl. 251-6.000.

Katagiri, Masahide: *See*—
Ogiwara, Takashi; Isono, Kesao; and Katagiri, Masahide, 4,919,001, Cl. 74-10.520.

Katerberg, James A., to Eastman Kodak Company. Interlace method for scanning print head systems. 4,920,355, Cl. 346-1.100.

Kato, Masayasu, to Takeda Chemical Industries, Ltd. Method of producing nitrogen-containing heteroaromatic compounds having an alkoxy group. 4,920,230, Cl. 546-290.000.

Kato, Ryohei: *See*—
Harebe, Atsushi; and Kato, Ryohei, 4,920,482, Cl. 364-200.000.

Kato, Takashi; Morita, Yutaka; Yamaguchi, Takeshi; Tsuge, Kazuo; Imamura, Kyoji; Kawai, Yoshio; Hasegawa, Hiroaki; and Amemori, Hiroyuki, to Osaka Gas Co., Ltd.; and Tokico Ltd. Turbine flowmeter. 4,918,996, Cl. 73-861.910.

Katoh, Tokunori: *See*—
Akao, Michitoshi; Sakakibara, Kenji; Katoh, Tokunori; Sawaki, Yukichi; Sonoda, Takakuni; and Suzuki, Makoto, 4,920,375, Cl. 355-27.000.

Katsura, Yoshiro, to Terumo Kabushiki Kaisha. Blood filter. 4,919,802, Cl. 210-188.000.

Katsuyama, Koji: *See*—
Yamamoto, Haruhiko; Suzuki, Masahiro; Udagawa, Yoshiaki; Nakata, Mitsuhiko; Katsuyama, Koji; Ono, Izumi; and Kikuchi, Shunichi, 4,920,574, Cl. 361-385.000.

Kaustrater, Gert; and Muller, Norbert, to Kuka Wehrtechnik GmbH. Armoured car. 4,919,038, Cl. 89-46.000.

Kautex Werke Reinold Hagen AG: *See*—
Thomas, Alfred, 4,919,855, Cl. 264-21.000.

Kautz, Randall: *See—*
Lazarus, Richard M.; Kautz, Randall; and Dixit, Sunit S., 4,920,028, Cl. 430-192.000.

Kavizky, Abraham. Locking device particularly useful for locking motorcycles, bicycles and the like. 4,918,951, Cl. 70-53.000.

Kawahara, Hideo: *See—*
Tada, Hiroaki; Yoshida, Harunobu; Kawahara, Hideo; and Miyata, Kunio, 4,919,521, Cl. 350-362.000.

Kawai, Hideshi: *See—*
Isowa, Eiichi; Kawai, Hideshi; Kajita, Harumi; and Matsui, Hiroki, 4,919,353, Cl. 242-58.600.

Kawai, Shichio: *See—*
Kishimoto, Mikio; Kawai, Tomoji; and Kawai, Shichio, 4,919,776, Cl. 204-157.400.

Kawai, Tatsundo: *See—*
Ogura, Makoto; Kawai, Tatsundo; Yamada, Katsuhiko; and Seito, Shinichi, 4,920,431, Cl. 358-496.000.

Kawai, Tomoji: *See—*
Kishimoto, Mikio; Kawai, Tomoji; and Kawai, Shichio, 4,919,776, Cl. 204-157.400.

Kawai, Yoshio: *See—*
Kato, Takashi; Morita, Yutaka; Yamaguchi, Takeshi; Tsuge, Kazuo; Imamura, Kyoji; Kawai, Yoshio; Hasegawa, Hiroaki; and Amemori, Hiroyuki, 4,918,996, Cl. 73-861.910.

Kawakami, Hirokazu: *See—*
Watanabe, Ryuji; Kosano, Motohiko; and Kawakami, Hirokazu, 4,918,806, Cl. 148-16.500.

Kawakami, Masumi, to Texas Instruments Incorporated. Insulated-gate field-effect semiconductor device with doped regions in channel to raise breakdown voltage. 4,920,393, Cl. 357-23.800.

Kawakami, Yuji: *See—*
Watanabe, Yosuke; Kawakami, Yuji; Kikuchi, Koichiro; Ogawa, Yoshiyuki; and Sato, Hiroshi, 4,919,926, Cl. 424-81.000.

Kawamorita, Yoichi: *See—*
Kimura, Tomohiro; and Kawamorita, Yoichi, 4,920,021, Cl. 430-56.000.

Kawamoto, Yoji; Yuhara, Tetsuo; Takagi, Koichi; and Udagawa, Kanji, to Mitsubishi Jukogyo Kabushiki Kaisha; and Mitsubishi Metal Corporation. Bottom structure of a thin-walled can. 4,919,294, Cl. 220-70.000.

Kawasaki Steel Corp.: *See—*
Yamada, Sumio; Tada, Chikashi; Taoka, Keizo; and Bada, Hajime, 4,919,713, Cl. 75-532.000.

Kawasaki, Tutomu: *See—*
Aiki, Kunio; Sasayama, Atsushi; Nemoto, Tugio; Haneda, Makoto; Ishii, Satoru; Kugimiya, Haruo; and Kawasaki, Tutomu, 4,920,262, Cl. 250-227.110.

Kawasako, Yasuhiro: *See—*
Ogami, Muneyuki; Kawasako, Yasuhiro; Otsuka, Takenori; Hiraoka, Tetsuo; and Hatamura, Koichi, 4,919,087, Cl. 123-52.0MV.

Kawauchi, Yoshikazu: *See—*
Tomii, Kaoru; Miyama, Hiroshi; Kawauchi, Yoshikazu; and Nishida, Jun, 4,920,410, Cl. 358-67.000.

Kee, Peter M. Y. Ceramic fitting for tubular furniture construction. 4,919,561, Cl. 403-305.000.

Keenan, Brian J.: *See—*
Eardley, Richard A.; Keenan, Brian J.; Lawson, Ian A.; and McAllister, John, 4,920,237, Cl. 200-5.00A.

Keese, Charles R.: *See—*
Giaever, Ivar; and Keese, Charles R., 4,920,047, Cl. 435-7.000.

Kehler, Garry, to 378134 Alberta Ltd. Swing-out backpack for wheelchairs. 4,919,443, Cl. 280-304.100.

Keidar, Itzhak; Dromi, Asher; and Tilman, Menahem. Moebius ring puzzle. 4,919,427, Cl. 273-155.000.

Keiper Recaro GmbH & Co.: *See—*
Deegener, Elmar; Wolsiefer, Harald; and Cremer, Heinz P., 4,919,488, Cl. 297-468.000.

Keller, Stephen A.; Spry, Piper A.; Adams, Martha S.; and Harper, Ralph G., to Texas Instruments Incorporated. Method of forming metal interconnects. 4,920,072, Cl. 437-192.000.

Kelley, Matthew O.: *See—*
Creps, John L.; and Kelley, Matthew O., 4,919,824, Cl. 210-770.000.

Kelyx, Inc.: *See—*
Ely, Ralph L., Jr., 4,919,380, Cl. 248-311.200.

Kemp, Dennis E., Jr., to Basseches, Mark T., a part interest. Roller speed reduction drive. 4,919,011, Cl. 475-183.000.

Kemp Development Corporation: *See—*
Kemp, Willard E., 4,919,391, Cl. 251-148.000.

Kemp, Merle L.: *See—*
Allard, John J.; Kemp, Merle L.; and Janicek, Alan J., 4,918,833, Cl. 29-621.100.

Kemp, Willard E., to Kemp Development Corporation. flanged connection for valves. 4,919,391, Cl. 251-148.000.

Kenehan, James G.: *See—*
Wright, E. Scott; and Kenehan, James G., 4,919,594, Cl. 416-230.000.

Kenney Manufacturing Company: *See—*
Comeau, Paul E.; DeBeau, John M.; and Torti, Anthony, 4,919,185, Cl. 160-178.100.

Kenny, Philip; Cautis, Dan; and Bizjak, John, to Brier Technology, Inc. Dual reference track scheme. 4,918,972, Cl. 73-1.00R.

Kensey Nash Corporation: *See—*
Nash, John, 4,919,647, Cl. 600-16.000.

Keptel, Inc.: *See—*
Graham, Thomas G., 4,919,544, Cl. 379-399.000.

Kerner, Wolfgang: *See—*
Zier, Horst D.; Kerner, Wolfgang; and Pfeiffer, Ernst F., 4,919,141, Cl. 128-635.000.

Kerttula, Reima, to Valmet Paper Machinery Inc. Web former for a paper machine. 4,919,760, Cl. 162-300.000.

Keyser, Frank T., to Liquid Container Corporation. Method for in-mold labeling of a blow molded article. 4,919,879, Cl. 264-509.000.

Khare, Ashok K., to National Forge Company. Khare pipe mold steel. 4,919,735, Cl. 148-334.000.

Kiely, John S.: *See—*
Domagala, John M.; Hagen, Susan E.; and Kiely, John S., 4,920,120, Cl. 514-254.000.

Kiemle, Peter: *See—*
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Kieserling & Albrecht GmbH & Co.: *See—*
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Kiesewetter, Martin V.; and Renski, William J., to Caterpillar Inc. Ground engaging tool. 4,918,843, Cl. 37-142.00A.

Kikuchi, Hidenori, to Kabushiki Kaisha Sato. Carbon ribbon supply apparatus for a printer. 4,919,555, Cl. 400-224.200.

Kikuchi, Kazuhiko: *See—*
Sawamura, Mitsuharu; Hongu, Kazuoki; and Kikuchi, Kazuhiko, 4,920,007, Cl. 428-457.000.

Kikuchi, Koichiro: *See—*
Watanabe, Yosuke; Kawakami, Yuji; Kikuchi, Koichiro; Ogawa, Yoshiyuki; and Sato, Hiroshi, 4,919,926, Cl. 424-81.000.

Kikuchi, Shunichi: *See—*
Yamamoto, Haruhiko; Suzuki, Masahiro; Udagawa, Yoshiaki; Nakata, Mitsuhiko; Katsuyama, Koji; Ono, Izumi; and Kikuchi, Shunichi, 4,920,574, Cl. 361-385.000.

Kim, Chun-Joong: *See—*
Hong, Pil-Young; Oh, Tae-Yup; Kim, Chun-Joong; and Kang, Sang-Suk, 4,920,066, Cl. 437-57.000.

Kim, Jong D. Waveform actuating air compressor. 4,919,601, Cl. 418-51.000.

Kim, Mee S.: *See—*
Kim, Yun S.; and Kim, Mee S., 4,919,276, Cl. 211-13.000.

Kim, Yun S.; and Kim, Mee S. Portable desk top tray. 4,919,276, Cl. 211-13.000.

Kimball, Ronald L.: *See—*
Hoke, Duane E.; Kimball, Ronald L.; and Quinn, David E., 4,919,510, Cl. 350-96.210.

Kimberly-Clark Corporation: *See—*
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Parsons, Mark N.; and Abba, Rodney L., 4,919,877, Cl. 264-282.000.
Sigl, Wayne C.; and Murray, Frank C., 4,919,835, Cl. 252-91.000.

Kimura, Akeo: *See—*
Morioka, Osamu; Tokushige, Keizo; Kimura, Akeo; and Nihei, Takahiro, 4,918,928, Cl. 62-51.100.

Kimura, Kazumasa: *See—*
Irie, Yoshio; Iwasaki, Kaoru; Hatsuda, Takumi; Kimura, Kazumasa; Harada, Nobuyuki; Ishizaki, Kunihiko; Shimomura, Tadao; and Fujiwara, Teruaki, 4,920,202, Cl. 528-500.000.

Kimura, Takashi; and Mori, Mitsuo, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Vehicle key device. 4,918,955, Cl. 70-277.000.

Kimura, Takashi; Chihara, Kenichi; Tomatsu, Masahiro; Inoue, Kazunobu; Yano, Norio; and Adachi, Osamu, to Nippon Telegraph and Telehpone Corp.; Fujitsu Limited; and Fujitsu Kasei Ltd. Flexible magnetic diskette. 4,920,441, Cl. 360-133.000.

Kimura, Tomoaki: *See—*
Kobayashi, Kazuo; Kajiwara, Toshiyuki; Sekiya, Teruo; and Kimura, Tomoaki, 4,918,965, Cl. 72-243.000.

Kimura, Tomohiro; and Kawamorita, Yoichi, to Canon Kabushiki Kaisha. Electrophotographic photosensitive member. 4,920,021, Cl. 430-56.000.

Kimura, Tsutomu: *See—*
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Kincaid, John W., to Cooper Industries, Inc. Audio cable. 4,920,233, Cl. 174-36.000.

Kindelberger, Jack D.: *See—*
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Kindex, Inc.: *See—*
Brun, Charles J., 4,919,588, Cl. 414-798.400.

King, Francis D.; and Joiner, Karen A., to Beecham Group p.l.c. Substituted indoles and their use as 5-HT_3 receptor antagonists. 4,920,127, Cl. 514-278.000.

King, Joseph N.: *See—*
Cude, Richard J.; and King, Joseph N., 4,918,784, Cl. 16-114.00R.

King, Milton T., to Dowell Schlumberger Incorporated. Method for treating subterranean formations. 4,919,209, Cl. 166-300.000.

King, Patrick D., to Flo-Con Systems, Inc. Stationary injection block and injection slide plate for use with an injection valve. 4,919,397, Cl. 266-267.000.

King-Smith, Anthony D.: *See—*
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Kinnear, Duane W. Disposable glove or mitt for self-service gasoline and frozen food handler. 4,918,755, Cl. 2-161.00R.

Kinoshita, Yoshimi: *See*—
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Kinugawa Rubber Industrial Co., Ltd.: *See*—
Seino, Hitoshi; Kondo, Kensuke; and Takamiya, Takeomi, 4,919,471, Cl. 296-154.000.
Kipp, Robert M.: *See*—
Kruka, Vitold R.; Kipp, Robert M.; and Cadena, Edward R., 4,920,523, Cl. 367-188.000.
Kircher, Dieter; and Schwarzer, Paul, to Alfred Teves GmbH. Anti-skid controlled hydraulic brake system. 4,919,495, Cl. 303-113.000.
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Fossum, Eric R.; Kirchner, Peter D.; Pettit, George D.; Warren, Alan C.; and Woodall, Jerry M., 4,920,069, Cl. 437-90.000.
Kirin Brewery Co., Ltd.: *See*—
Honma, Tohru; Mori, Shigeki; Ohya, Kunihiko; Matsumoto, Shiro; Nakata, Akira; Abe, Ichiro; and Hosaka, Naoto, 4,918,902, Cl. 53-403.000.
Kirk, Jay B.: *See*—
Evans, Gary A.; and Kirk, Jay B., 4,919,507, Cl. 350-96.190.
Kirk, Karl D., III: *See*—
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Kirker, Garry W.: *See*—
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Kirsh, Janet A.; Longobardi, Cheryl A.; and Kirsh, Thomas, to Kirsh, Janet A.; and Longobardi, Cheryl A. Container. 4,919,296, Cl. 220-85.00H.
Kirsh, Thomas: *See*—
Kirsh, Janet A.; Longobardi, Cheryl A.; and Kirsh, Thomas, 4,919,296, Cl. 220-85.00H.
Kirst, Herbert A.; and Leeds, James P., to Eli Lilly and Company. Modifications of mycinose and 3-O-demethylmycinose in tylosin-type macrolides. 4,920,103, Cl. 514-30.000.
Kirst, Herbert A.: *See*—
Gidda, Jaswant S.; Kirst, Herbert A.; and Robertson, David W., 4,920,102, Cl. 514-28.000.
Kishimoto, Mikio; Kawai, Tomoji; and Kawai, Shichio, to Hitachi Maxell, Ltd. Ferromagnetic powder and method for producing the same. 4,919,776, Cl. 204-157.400.
Kishimoto, Shunichi: *See*—
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Kistner, Kenneth J., to Specified Equipment Systems Co., Inc. Pump apparatus for multiple component fluids. 4,919,597, Cl. 417-403.000.
Kita, Eizo: *See*—
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Kitagawa, Hiroji: *See*—
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Kitagawa Industries Co., Ltd.: *See*—
Matsui, Kazuhiro; and Kitagawa, Hiroji, 4,919,462, Cl. 285-175.000.
Yamaguchi, Akio, 4,920,235, Cl. 174-36.000.
Kitagawa, Kunio; Maeda, Akira; and Matsumura, Yoshio, to Dainippon Screen Mfg. Co., Ltd. Apparatus for heat treatment of a substrate. 4,919,614, Cl. 432-259.000.
Kitamura, Takayuki: *See*—
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Kitta, Satoru, to Fujikoshi Machinery Corporation. Method for lapping a wafer material and an apparatus therefor. 4,918,869, Cl. 51-131.100.
Kiyohara, Takehiko: *See*—
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Klein, Heinz-Gunter, deceased: *See*—
Wehling, Bernhard; Makowka, Bernd; Klein, Heinz-Gunter, deceased; Klein, Gertrud, heir; and Rosentreter, Helga, 4,919,680, Cl. 8-94.270.
Kliman, Gerald B., to General Electric Company. Method of fabricating composite rotor laminations for use in reluctance, homopolar and permanent magnet machines. 4,918,831, Cl. 29-598.000.
Klinkner, Walter: *See*—
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Klocke, Donald J.: *See*—
Absil, Robert P. L.; Chang, Clarence D.; Chu, Cynthia T-W.; and Klocke, Donald J., 4,919,790, Cl. 208-78.000.
Klocke, Kenneth J. Hand-held sanding device. 4,918,875, Cl. 51-370.000.
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Bonfert, Helmut; Hardt, Thomas; Klumpp, Rolf; and Wagner, Wolf-Dietrich, 4,919,371, Cl. 248-56.000.
Knapen, Joannes W. J.: *See*—
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Knapp, Jamie. Process for II-VI compound epitaxy. 4,920,067, Cl. 437-81.000.
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Knaus, Dennis A., to Packaging Industries Group, Inc. Method for making multicolored foam. 4,919,864, Cl. 264-45.900.
Knavish, Leonard A., to PPG Industries, Inc. Avoidance of nickel sulfide stones in a glass melting operation. 4,919,698, Cl. 65-134.000.
Kneipp, Kenneth G.: *See*—
Chirhart, Dennis J.; Daniels, Michael P.; and Kneipp, Kenneth G., 4,919,741, Cl. 156-223.000.
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Knight, Cyril H., deceased: *See*—
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Knoll, Randall L.; Lewon, Wilhelm; and Ofstead, Ronald, to Minnesota Mining and Manufacturing Company. Hydrogel implant lens construction reconfigured dehydrated re-hydrated in situ. 4,919,662, Cl. 623-6.000.
Koatsu Gas Kogyo Co. Ltd.: *See*—
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Kobayashi, Atsuo; Yamada, Takuma; and Akao, Kiyoshi, to Dainippon Screen Mfg. Co., Ltd. Surface treatment method and apparatus thereof. 4,919,073, Cl. 118-688.000.
Kobayashi, Kazuo; Kajiwara, Toshiyuki; Sekiya, Teruo; and Kimura, Tomoaki, to Hitachi, Ltd. Multihigh rolling mill. 4,918,965, Cl. 72-243.000.
Kobayashi, Kazuyoshi: *See*—
Okubo, Toshimitsu; Kobayashi, Kazuyoshi; Ohmura, Kohki; Sai, Yoshinobu; Satoh, Takuo; Yoshino, Yukihiko; Hoshi, Nobuyuki; Onodera, Takayuki; Endoh, Yasuo; Irokawa, Sigenobu; and Sannohe, Toshiaki, 4,919,045, Cl. 101-142.000.
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Kobayashi, Takehiro, to Ryobi Ltd. Fishing spinning reel. 4,919,361, Cl. 242-309.000.
Kobayashi, Toshio; Otomo, Shigekazu; Nakatani, Ryoichi; and Kumasaka, Noriyuki, to Hitachi, Ltd. Magnetic Multilayer structure. 4,920,013, Cl. 428-694.000.
Kobayashi, Toshiyuki: *See*—
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Koch, Ronald J.; Knapp, John F.; and Gruber, Robert J., to Xerox Corporation. Stable color developer compositions and process for the preparation thereof. 4,920,023, Cl. 430-126.000.
Koch, Rudolf: *See*—
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Zweymuller, K.; and Koch, Rudolf, 4,919,676, Cl. 623-22.000.
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Kodama, Seiki; and Murata, Shigemi, to Mitsubishi Denki Kabushiki Kaisha. Ignition distributor for an internal combustion engine. 4,919,106, Cl. 123-617.000.

Koetsch, Paul W.: *See*—
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Koettgen GmbH & Co. KG: *See*—
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Kohl, Heinz; Pohl, Helmut; and Puchl, Alois, to Vereinigte Edelstahlwerke AG (VEW). Method of manufacturing nonmagnetic drilling string components. 4,919,728, Cl. 148-12.00B.
Kohlenbrenner, Siegmar. Element structure and process for assembling same. 4,919,122, Cl. 126-98.000.
Koike, Hiroyuki; Hata, Yukihiro; and Sogabe, Mitsushi, to Tanazawa Hakko Sha Co., Ltd. Plastics shaping mold having patterned resin layer. 4,919,388, Cl. 249-115.000.
Koito Seisakusho Co., Ltd.: *See*—
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Koizumi, Hiroyuki: *See*—
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Koizumi, Norihiko: *See*—
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Koleske, Joseph V.; and Osborn, Claiborn L., to Union Carbide Chemicals and Plastics Company Inc. Blends of cyclic vinyl ether containing compounds and urethane acrylates. 4,920,156, Cl. 522-31.000.
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Konica Corporation: *See*—
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Konigs, Wilhelm; and Hrovat, Milan, to NUKEM GmbH and ALKEM GmbH. Method for sintering high temperature ceramics. 4,919,867, Cl. 264-57.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
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Koshimo, Masahiko, to Kabushiki Kaisha Daikin Seisakusho. Lockup damper for torque converter. 4,919,241, Cl. 192-3.290.
Kosik, Joseph F., Sr.; and Firestone, Bruce M., to Mt. Holly, Inc. Snow making apparatus and method for making snow. 4,919,331, Cl. 239-2.200.
Kosley, Raymond W., Jr.; Cherill, Robert J.; and O'Malley, Gerard, to Hoechst Roussel Pharmaceuticals Inc. Carbamoyloxylabdane compounds useful in reducing intraocular pressure. 4,920,146, Cl. 514-437.000.
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Kostek, Gloria J.: *See*—
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Kotake, Naoyuki: *See*—
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Kotake, Yoichiro: *See*—
Miki, Kenichi; and Kotake, Yoichiro, 4,918,918, Cl. 60-489.000.
Kotob, Mohammed N. Multimode digital timepiece. 4,920,524, Cl. 368-240.000.
Kotowski, Stephan; Busse, Bernd; and Donnerhak, Bernd, to Heraeus Elektroden GmbH. Inspection of electrodes having activated layers. 4,919,766, Cl. 204-153.100.
Kotzebue, Paul: *See*—
Hall, Nelson W.; and Kotzebue, Paul, 4,919,063, Cl. 114-56.000.
Kouchi, Toshihito: *See*—
Okada, Takao; Nakamura, Takeaki; Nakamura, Kazuo; Nishioka, Kimihiko; Kouchi, Toshihito; Yamamoto, Hiroyuki; and Tomabechi, Hideo, 4,919,520, Cl. 350-331.00T.
Kousai, Tadashi; Moriuchi, Yousuke; and Ishida, Toshinobu, to Terumo Kabushiki Kaisha. Extrusion apparatus for molding guiding tube for medical instruments. 4,919,605, Cl. 425-467.000.
Kousaka, Shoji: *See*—
Yoshida, Makoto; Sato, Masahiro; Koga, Kazunori; Osamura, Kazumi; Kousaka, Shoji; Maeda, Tatsumi; Yokoyama, Kiyoshi; and Matsunaka, Masafumi, 4,920,085, Cl. 501-97.000.
Kovtun, John M.: *See*—
Arora, Vijay K.; Jones, Gary V.; Kovtun, John M.; and Brandlein, Lawrence S., 4,919,962, Cl. 426-594.000.
Koyama, Nobuhiko: *See*—
Ishiguro, Yuji; Hosokawa, Hiroyuki; Koyama, Nobuhiko; Hiramatsu, Eiji; Takao, Mitsunori; Abe, Tomoaki; Kiyono, Masashi; Maeda, Katsuya; and Kamio, Shigeru, 4,919,103, Cl. 123-514.000.
Koyo Seiko Co., Ltd.: *See*—
Nunotani, Masao; and Matsumoto, Masaaki, 4,919,551, Cl. 384-482.000.
Koyo Seiko Kabushiki Kaisha: *See*—
Hiramatsu, Takeo; Fujita, Kenjiro; Nagayoshi, Yoshimasa; Hirakushi, Shuzo; and Hamasaki, Yoshiaki, 4,919,248, Cl. 192-61.000.
Kozelsky, Joseph D.: *See*—
West, Henry L.; and Kozelsky, Joseph D., 4,920,570, Cl. 381-68.000.
Kozlowski, Maya; and Glasse-Davies, Wayne, to Allelix, Inc. Shuttle vectors from rhodococcus equi. 4,920,054, Cl. 435-252.310.
Kraft General Foods, Inc.: *See*—
Willey, Monroe J.; and Evert, Daniel D., 4,919,785, Cl. 206-625.000.
Kramer, Albert, to EMS Holland B.V. Gas meter. 4,918,994, Cl. 73-861.530.
Kranz, Curt, to MECRON medizinische Produkte GmbH. Hip joint prosthesis having a cylindrical shaft portion. 4,919,678, Cl. 623-23.000.
Krappitz, Heinz; Wolfel, Herbert; and Wolfrum, Johannes, to B.A.T. Cigarettenfabriken GmbH. Apparatus for supplying a stack of carton blanks form a pallet to the magazine of a carton-packing machine. 4,919,589, Cl. 414-798.900.
Kratsch, Charles H.: *See*—
Paschke, Robert A.; Mosel, James A.; Kratsch, Charles H.; White, Dean; and Edinger, Travis H., 4,918,878, Cl. 52-28.000.
Kreager, William D., Jr., to Frito-Lay, Inc. Method and apparatus for forming fin-type back seals. 4,919,740, Cl. 156-203.000.
Krenicki, Joseph: *See*—
Morton, William E.; Fairbanks, Harold V.; Wallis, James; Hunicke, Raymond L.; and Krenicki, Joseph, 4,919,807, Cl. 210-388.000.
Krenitsky, Thomas A.: *See*—
Koszalka, George W.; and Krenitsky, Thomas A., 4,920,210, Cl. 536-24.000.
Kress, Hans-Jurgen: *See*—
Buysch, Hans-Josef; Schon, Norbert; Kress, Hans-Jurgen; Eichenauer, Herbert; and Buekers, Josef, 4,920,166, Cl. 524-141.000.
Krieger, Roger B.; and Rask, Rodney B., to General Motors Corporation. Two cycle engine scavenging heat control. 4,919,088, Cl. 123-65.00A.

Kroeger, Donald C.: *See*—
Cole, B. Harrison; Kroeger, Donald C.; and Wilson, Mark E., 4,919,918, Cl. 424-44.000.
Krone Aktiengesellschaft: *See*—
Mroynski, Gerd, 4,919,503, Cl. 350-96.200.
Krueger, Steven E.: *See*—
Otte, Donald R.; and Krueger, Steven E., 4,919,394, Cl. 256-65.000.
Kruit, Jan; and Knapen, Joannes W. J., to Hoogovens Groep B.V. Apparatus for sorting metal bars by length. 4,919,273, Cl. 209-517.000.
Kruka, Vitold R.; Kipp, Robert M.; and Cadena, Edward R., to Shell Oil Company. Hydrophone mount. 4,920,523, Cl. 367-188.000.
Krupp Polysius AG: *See*—
Lohnherr, Ludger, 4,919,341, Cl. 241-18.000.
Kruschik, Klaus: *See*—
Nowak, Gerhard; Winter, Alfred; Morbitzer, Hans P.; Theuer, Rudolf; and Kruschik, Klaus, 4,919,448, Cl. 280-618.000.
Kruse, Richard M., to Great Plains Industries, Inc. Apparatus and method for calibrating a measuring device. 4,918,973, Cl. 73-3.000.
Kubbutat, Albert F., to Sto Aktiengesellschaft. Manufacture of light-weight structural elements. 4,919,866, Cl. 264-45.300.
Kubo, Haruo: *See*—
Takeuchi, Hirosato; Tanaka, Yutaka; Miyazaki, Osahiko; Saito, Noboru; Kubo, Haruo; Kotake, Naoyuki; and Nagumo, Makoto, 4,918,969, Cl. 72-334.000.
Kubo, Keiji: *See*—
Ichimura, Kunihiro; and Kubo, Keiji, 4,920,030, Cl. 430-270.000.
Kubo, Yoshifumi: *See*—
Tateishi, Akitaka; Arakawa, Tadao; Kurosawa, Masaru; Kubo, Yoshifumi; and Nagai, Yoji, 4,920,276, Cl. 290-2.000.
Kubota Ltd.: *See*—
Yang, Choong-Jin; and Ray, Ranjan, 4,919,732, Cl. 148-103.000.
Kuchenbecker, Morris W., to James River Corporation. Carton with tear strip. 4,919,271, Cl. 206-611.000.
Kuenasi, Christoph: *See*—
Neubauer, Hans-Jurgen; Seppelt, Wolfgang; Burstinghaus, Rainer; Hofmeister, Peter; and Kuenasi, Christoph, 4,920,110, Cl. 514-438.000.
Kugimiya, Haruo: *See*—
Aiki, Kunio; Sasayama, Atsushi; Nemoto, Tugio; Haneda, Makoto; Ishii, Satoru; Kugimiya, Haruo; and Kawasaki, Tutomu, 4,920,262, Cl. 250-227.110.
Kuka Wehrtechnik GmbH: *See*—
Kaustrater, Gert; and Muller, Norbert, 4,919,038, Cl. 89-46.000.
Kulkarni, Rupali A.: *See*—
Deckner, George E.; and Kulkarni, Rupali A., 4,919,934, Cl. 424-401.000.
Kumano, Kazuo: *See*—
Kakimoto, Norihiro; Kumano, Kazuo; and Nakamura, Kunie, 4,919,917, Cl. 424-10.000.
Kumasaka, Noriyuki: *See*—
Kobayashi, Toshio; Otsono, Shigekazu; Nakatani, Ryoichi; and Kumasaka, Noriyuki, 4,920,013, Cl. 428-694.000.
Kumazawa, Satoru: *See*—
Ito, Atsushi; Kumazawa, Satoru; Sato, Nobuo; and Saishoji, Toshihide, 4,920,138, Cl. 514-383.000.
Kume, Takeshi, to T.K.M. Engineering Kabushiki Kaisha. Stepless speed change apparatus. 4,919,002, Cl. 74-199.000.
Kunz, Norbert: *See*—
Schlapp, Albert; and Kunz, Norbert, 4,919,475, Cl. 296-213.000.
Kuo, Chun-Liang, to Pencell Co., Ltd. Writing implement having simplified lead-feeding mechanism. 4,919,556, Cl. 401-57.000.
Kuo, Hideo, to Canon Kabushiki Kaisha. Display apparatus. 4,920,337, Cl. 340-721.000.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Shida, Takafumi; Arabori, Hideo; Watanabe, Takeo; Kanda, Yohichi; Yamazaki, Shiro; and Shinkawa, Hiroyasu, 4,919,707, Cl. 71-92.000.
Kureha Kagaku Kogyo Kabushiki Kaishi: *See*—
Ito, Atsushi; Kumazawa, Satoru; Sato, Nobuo; and Saishoji, Toshihide, 4,920,138, Cl. 514-383.000.
Kurihara, Noboru, to Mitsubishi Denki Kabushiki Kaisha. Pulse doppler radar system. 4,920,347, Cl. 342-130.000.
Kurihara, Toshiyuki; Aomoto, Benso; and Nishio, Ko, to Sanyo Electric Co., Ltd. Apparatus for mounting parts onto a printed substrate. 4,919,074, Cl. 118-697.000.
Kuroishi, Yoshitada, to Unix Corp. Portable clothes cover. 4,919,262, Cl. 206-287.100.
Kuroiwa, Takaai: *See*—
Sakai, Yoshiro; Sadaoka, Yoshihiko; Kuroiwa, Takaai; Abe, Tooru; and Miyagishi, Tetsuya, 4,920,451, Cl. 361-286.000.
Kurosawa, Masaru: *See*—
Tateishi, Akitaka; Arakawa, Tadao; Kurosawa, Masaru; Kubo, Yoshifumi; and Nagai, Yoji, 4,920,276, Cl. 290-2.000.
Kurtz, Andrew D.; and Winston, Anthony E., to Church & Dwight Co., Inc. Process for the production of potassium bicarbonate. 4,919,910, Cl. 423-422.000.
Kurz, Gunter; Abels, Martin; Schwirtlich, Ingo; and Woditsch, Peter, to Bayer Aktiengesellschaft. Process for the production of solar silicon. 4,919,913, Cl. 423-348.000.
Kusakabe, Akira: *See*—
Hiraki, Hikosaburo; Murakami, Toshibumi; and Kusakabe, Akira, 4,919,093, Cl. 123-299.000.
Kuster, Hans W.: *See*—
Vanaschen, Luc; Kuster, Hans W.; and Radermacher, Herbert, 4,918,946, Cl. 65-104.000.
Kuttenn, Frederique: *See*—
Mauvais-Jarvis, Pierre; and Kuttenn, Frederique, 4,919,937, Cl. 424-449.000.
Kuwabara, Takao; Nakagawa, Hiroto; and Kita, Eizo, to Hitachi, Ltd.; and Kansai Electric Power Co., Inc. Control system for a variable speed hydro-power plant apparatus. 4,920,277, Cl. 290-40.00C.
Kuzmuk, Jeffery S.: *See*—
Caveney, Jack E.; and Kuzmuk, Jeffery S., 4,919,373, Cl. 248-74.300.
Kuzuha, Yoshihiro: *See*—
Tokumasu, Osamu; Kuzuha, Yoshihiro; Suzuki, Hirosi; and Awata, Bunichiro, 4,918,832, Cl. 29-606.000.
Kyocera Corporation: *See*—
Yoshida, Makoto; Sato, Masahiro; Koga, Kazunori; Osamura, Kazumi; Kousaka, Shoji; Maeda, Tatsumi; Yokoyama, Kiyoshi; and Matsunaka, Masafumi, 4,920,085, Cl. 501-97.000.
Kyoto Medical Science Laboratory: *See*—
Okuda, Shoji; and Uchida, Kazuo, 4,920,045, Cl. 435-7.000.
Kyoya, Michio; and Fukuzumi, Katsuhiko, to Mitsubishi Denki Kabushiki Kaisha; and Mitsubishi Jukogyo Kabushiki Kaisha. Turbocharging pressure controlling apparatus. 4,918,924, Cl. 60-602.000.
Kyrtsos, Christos T.; and Worrell, Dean A., to Caterpillar Inc. Dynamic payload monitor. 4,919,222, Cl. 177-139.000.
Laapotti, Jorma; and Tapio, Olli, to Valmet Paper Machinery Inc. Press section and press section/frame construction combination in a paper machine. 4,919,762, Cl. 162-360.100.
Laapotti, Jorma: *See*—
Ilmarinen, Antti; Miihkinen, Veijo; and Laapotti, Jorma, 4,919,759, Cl. 162-206.000.
Laber, Hans: *See*—
Frankenberg, Wolfgang; Laber, Hans; and Weschta, Alois, 4,920,473, Cl. 363-96.000.
Lablee, Jean: *See*—
Bussiere, Guy; and Lablee, Jean, 4,919,944, Cl. 426-39.000.
Laboratoires Syntex S.A.: *See*—
Genain, Gilles, 4,920,225, Cl. 546-21.000.
Labrijn, Hans, to U.S. Philips Corp. Electric shaving apparatus. 4,918,819, Cl. 30-43.000.
Lackey, Donald V., to Dunmore Corporation. Metallized capacitor with corrosion resistant electrodes. 4,920,452, Cl. 361-305.000.
Ladner, David W.: *See*—
Los, Marinus; Ladner, David W.; and Cross, Barrington, 4,920,226, Cl. 546-80.000.
Lafay, William T.; and Meistrell, William F. Oil absorption method. 4,919,820, Cl. 210-671.000.
Lafler, Robert E., to Westvaco Corporation. Simulated watermark printing system. 4,919,044, Cl. 101-141.000.
Lafleur, Guy: *See*—
Lesur, Pierre; Faury, Christian; Lafleur, Guy; and Papillon, Andre , 4,919,909, Cl. 423-360.000.
Lai, John Ta-Yuan; and Son, Pyong N., to B. F. Goodrich Company, The. N,N-disubstituted, α-(3,5-dialkyl-4-hydroxyphenyl)-α,α-disubstituted acetamides and composition stabilized therewith. 4,920,228, Cl. 546-224.000.
Laimighofer, Johann; Garnweidner, Peter; Ubiacker, Peter; and Luttinger, Johann, to Austria Metall Aktiengesellschaft. Structural shape (beam) especially for ramming protection in side doors and walls of motor-vehicle bodies. 4,919,473, Cl. 296-188.000.
Laing, Karsten: *See*—
Hensel, Hartmut; Laing, Oliver; and Laing, Karsten, 4,919,104, Cl. 123-533.000.
Laing, Oliver: *See*—
Hensel, Hartmut; Laing, Oliver; and Laing, Karsten, 4,919,104, Cl. 123-533.000.
Lakoski, Robert P.; and Numbers, Jody L., to Lama Systems, Inc. Computer data drive locking device. 4,918,952, Cl. 70-57.000.
Lama Systems, Inc.: *See*—
Lakoski, Robert P.; and Numbers, Jody L., 4,918,952, Cl. 70-57.000.
Lamarre, Daniel: *See*—
Hachey, Raynald; Lamarre, Daniel; and Marcotte, Jacques, 4,918,974, Cl. 73-27.00R.
Lambertz, Johannes; Adlhoch, Wolfgang H.; Mittelstadt, Alfred G.; and Hermann, Wolfgang, to Rheinische Braunkohlenwerke A.G. Apparatus for the production of gas containing hydrogen and carbon monoxide from solid fuel. 4,919,687, Cl. 48-62.00R.
Lambie, Ian A.; Yarrow, Paul I. W.; Langley, Robert; and Campbell, Colin D., to Ciba-Geigy Corporation. Production of dimethylaminomethyl copper phthalocyanine. 4,920,217, Cl. 540-135.000.
Landheer, Hugo A., to Hunter Douglas International N.V. Sandwich wall system panel. 4,918,895, Cl. 52-580.000.
Landis, David E.; and Del Grosso, Douglas G., to Lear Siegler Seating Corp. Inertia latch for vehicle seats. 4,919,482, Cl. 297-379.000.
Lange, Fritz: *See*—
Hoeffkes, Horst; Lange, Fritz; and Assmann, Achim, 4,919,923, Cl. 424-70.000.
Langer, Matthew E.; Policastro, Peter P.; and Shultz, Allan R., to General Electric Company. Liquid crystalline polyester siloxanes. 4,920,191, Cl. 528-26.000.
Langer, Ruth; and Layher, Ulrich. Scaffold platform section. 4,919,230, Cl. 182-179.000.
Langley, Robert: *See*—
Lambie, Ian A.; Yarrow, Paul I. W.; Langley, Robert; and Campbell, Colin D., 4,920,217, Cl. 540-135.000.
Langwald, Rainer: *See*—
Parazak, Dennis P.; Burkhardt, Charles W.; and Langwald, Rainer, 4,918,959, Cl. 72-39.000.

Langwell, John D.: *See*—
Alexander, Herman P.; and Langwell, John D., 4,919,377, Cl. 248-225.100.

Lankamp, Herman, to SKF Industrial Trading & Development Company, B.V. Bearing assembly. 4,919,550, Cl. 384-133.000.

Lannelongue, Jean. Shoulder prosthesis. 4,919,669, Cl. 623-19.000.

Lapierre, Gilles H. Processes and automatic devices for high-resolution writing on a support by projecting drops of colored liquids. 4,920,422, Cl. 358-296.000.

LaPierre, Rene B.: *See*—
Fischer, Ronald H.; LaPierre, Rene B.; Owens, Peter J.; and Varghese, Philip, 4,919,789, Cl. 208-61.000.

Larocca, John: *See*—
Benjamin, Olivier; Franklin, Robert P.; and Larocca, John, 4,919,383, Cl. 248-349.000.

Larsen, Kurt K.; and Santiago, Pete, to Blue Giant Equipment Corporation. Front rider lift truck. 4,919,233, Cl. 187-9.00R.

Larsen, Pamela L.: *See*—
Tibbetts, Clark; and Larsen, Pamela L., 4,920,211, Cl. 536-27.000.

Larson, Marlow W., to Browning. Cable guard assembly for compound bows. 4,919,108, Cl. 124-88.000.

Lashyro, Jeffrey A.; and Hoell, Norbert, to Minnesota Automation Inc. Bottom loading basket carrier. 4,919,261, Cl. 206-185.000.

Laska, Eugene M.: *See*—
Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., 4,920,149, Cl. 514-557.000.

LaSota, Denis E.: *See*—
Banyai, Bruce E.; LaSota, Denis E.; and Struck, Dennis L., 4,919,711, Cl. 75-321.000.

Lassiaz, Philippe: *See*—
Gay, Christian; and Lassiaz, Philippe, 4,919,246, Cl. 192-89.00B.

Lasson, Alan R., to Baker Hughes Incorporated. Clarifier assembly. 4,919,812, Cl. 210-519.000.

Lathers, Michael W., to Outboard Marine Corporation. Recreational boat sofa/sleeper. 4,919,068, Cl. 114-363.000.

Lauer, Wilhelm: *See*—
Schweikert, Wilhelm; Will, Norbert; and Lauer, Wilhelm, 4,920,457, Cl. 361-530.000.

Laugee, Catherine: *See*—
Ambier, Jean; Francillon, Marie-Jo; Allibert, Colette; and Laugee, Catherine, 4,919,717, Cl. 75-228.000.

Laughinghouse, Charles L.: *See*—
Olivier, James P.; Kane, Mary F.; Orr, Clyde, Jr.; Laughinghouse, Charles L.; Wagner, Jack J.; and Tidwell, Samuel V., 4,920,550, Cl. 378-51.000.

Laurence, Scott & Electromotors Ltd.: *See*—
Schwarz, Kurt K.; and Smith, Thomas D., 4,918,801, Cl. 29-596.000.

Lauverjat, Eric: *See*—
Charlet, Pascal; Lauverjat, Eric; and Moreno, Rafael, 4,920,279, Cl. 307-264.000.

Lavin, Mark A.: *See*—
Jaffe, Robert S.; Lavin, Mark A.; Rand, Rick A.; and Schreiner, Paul, 4,920,429, Cl. 358-471.000.

Lawrence, J. Michael: *See*—
Taggart, George W.; Denk, Lawrence T.; and Lawrence, J. Michael, 4,919,912, Cl. 423-574.00R.

Lawson, Ian A.: *See*—
Eardley, Richard A.; Keenan, Brian J.; Lawson, Ian A.; and McAllister, John, 4,920,237, Cl. 200-5.00A.

Lawson, James L.; and Harris, David C., to Torrington Company, The. Video game and the like control assembly. 4,919,003, Cl. 74-471.0XY.

Lawson, James L.; and Peterson, Ronald A., to Torrington Company, The. Hydrostatic spindle. 4,919,549, Cl. 384-113.000.

Lawson, R. Joe: *See*—
Bricker, Maureen L.; and Lawson, R. Joe, 4,919,902, Cl. 423-213.500.

Lawton, Geoffrey: *See*—
Attwood, Michael R.; Crackett, Peter H.; and Lawton, Geoffrey, 4,920,119, Cl. 514-243.000.

Lay, Henry P.: *See*—
Pitalo, Stephen K.; Walden, Donnie T.; and Lay, Henry P., 4,919,528, Cl. 350-620.000.

Lay, Kurt; and Sailer, Erwin, to Daimler-Benz AG. Plastic suction cup arrangement for laminatd glass pane repair. 4,919,986, Cl. 428-43.000.

Layher, Ulrich: *See*—
Langer, Ruth; and Layher, Ulrich, 4,919,230, Cl. 182-179.000.

Lazarus, Richard M.; Kautz, Randall; and Dixit, Sunit S., to Morton Thiokol, Inc. High contrast high thermal stability positive photoresists with mixed cresol and hydroxybenzaldehyde prepared novolak and photosensiitive diazoquinone. 4,920,028, Cl. 430-192.000.

Le, Quang N.: *See*—
Chen, Nai Y.; Garwood, William E.; Huang, Tracy J.; Le, Quang N.; and Wong, Stephen S., 4,919,788, Cl. 208-59.000.

Leach, Stuart C.: *See*—
Heaton, Robert A.; Leach, Stuart C.; Hancock, Joseph; and Sandy, Neil A., 4,919,125, Cl. 128-203.140.

Lear Siegler Seating Corp.: *See*—
Landis, David E.; and Del Grosso, Douglas G., 4,919,482, Cl. 297-379.000.

LeaRonal, Inc.: *See*—
Stavitsky, Robert, 4,919,720, Cl. 106-1.260.

Leatherman, Alfred F.; and Repik, Clyde P., to Heller, William C., Jr. Flocked glove and plastic sleeve member bonded thereto. 4,918,754, Cl. 2-16.000.

Lebon, Leon G. G.: *See*—
Christiaens, Alois E.; and Lebon, Leon G. G., 4,920,294, Cl. 310-162.000.

Leclerc, Denis: *See*—
Brosson, Philippe; Jacquet, Joel; Artigue, Claude; Leclerc, Denis; and Benoit, Jacques, 4,920,542, Cl. 372-50.000.

Lederer, David B.: *See*—
Walters, Robert E.; and Lederer, David B., 4,920,268, Cl. 250-353.000.

Lederer, Josef, to Salomon S.A. Ski boot. 4,918,842, Cl. 36-117.000.

Lee, Chi-Chang; and Simpson, Penny C., to Du Pont de Nemours, E. I., and Company. Point-bonded jet-softened polyethylene film-fibril sheet. 4,920,001, Cl. 428-289.000.

Lee, Jeffery W.: *See*—
Binkley, Joseph H.; Caro, Perry A.; Dillon, John B.; Fay, Charles R.; Gibbons, Jonathan; Hooks, Hilary N.; Kadifa, Abdo G.; Lee, Jeffery W.; Lynch, William C.; Mock, Clayton W.; Neely, Everett T.; Tallan, Michael L.; Thompson, Geoffrey O.; Vukkadala, Gaya; Wick, John D.; and Woods, Donald R., 4,920,481, Cl. 364-200.000.

Lee, Michael C.; and Dobberpuhl, Dale R., to Deere & Company. Hitch with anti-sway link. 4,919,215, Cl. 172-450.000.

Lee, Pei-Ing P.: *See*—
Bausmith, Robert C.; Cote, William J.; Cronin, John E.; Holland, Karey L.; Kaanta, Carter W.; Lee, Pei-Ing P.; and Wright, Terrance M., 4,919,750, Cl. 156-643.000.

Lee, Robert W.; and Brewer, Earl G., to General Motors Corporation. Method for producing laminated bodies comprising an RE-FE-B type magnetic layer and a metal backing layer. 4,920,009, Cl. 428-552.000.

Lee, Woo Y.: *See*—
Raythatha, Rasik H.; Tatarchuk, Bruce; and Lee, Woo Y., 4,920,086, Cl. 502-63.000.

Lee, Yeou-Ching, to Alvin Lee Jewelry, Inc. Combined display board and clip. 4,918,847, Cl. 40-152.100.

Leeds, James P.: *See*—
Kirst, Herbert A.; and Leeds, James P., 4,920,103, Cl. 514-30.000.

Leeming, Roland, to British Nuclear Fuels plc. Fluorine generating electrolytic cells. 4,919,781, Cl. 204-241.000.

Le Gall, Jean C., to Centre National d'Etudes des Telecommunications. Antenna mounting with passive stabilization. 4,920,349, Cl. 343-709.000.

Leggett & Platt, Incorporated: *See*—
Scott, Terence A., 4,918,773, Cl. 5-252.000.

Le Guen, Jacques: *See*—
Gabbay, Emile; and Le Guen, Jacques, 4,920,554, Cl. 378-200.000.

Lehmann, Rudolf; Hachmann, Klaus; Biermann, Manfred; and Schnegelberger, Harald, to Henkel Kommanditgesellschaft auf Aktien. Alkyl gylcosides as potentiating agents in antiseptic compositions. 4,920,100, Cl. 514-23.000.

Leiber, Heinz; Klinkner, Walter; and Haid, Robert, to Daimler-Benz AG. Stabilizer for vehicles. 4,919,444, Cl. 280-707.000.

Leiber, Heinz. Method and apparatus for controlling brake pressure in vehicle brake systems. 4,919,493, Cl. 303-15.000.

Leigh-Monstevens, Keith V.; and Mabee, Brian D., to Automotive Products plc. Coaxial push rod and hollow screw ball nut drive for master cylinder. 4,918,921, Cl. 60-545.000.

Leitzman, Noel E.: *See*—
Selzer, Robert J.; and Leitzman, Noel E., 4,919,399, Cl. 267-31.000.

Lemaire, Frederic, to SGS-Thomson Microelectronics S.A. Circuit compensating for the attenuation of a notch filter at frequencies less than cut-off frequency thereof. 4,920,563, Cl. 379-413.000.

Lemke, Timothy A., to Du Pont de Nemours, E. I., and Company. Round cable having a corrugated septum. 4,920,234, Cl. 174-36.000.

Lems, Peter; and Slomski, Edward J. Film encased package. 4,919,265, Cl. 206-432.000.

Lenz, Hans: *See*—
Baumgartner, Reinhold; Lenz, Hans; Stepp, Herbert; and Unsold, Eberhard, 4,920,541, Cl. 372-23.000.

Leonaggeo, Angelo, Jr. Hyrotherapy exercising device with scissor lift treadmill. 4,918,766, Cl. 4-495.000.

Leonard Bloom: *See*—
Fleischmann, Lewis W., 4,919,637, Cl. 446-162.000.

Lepofsky, Robert J.: *See*—
Gaudet, Peter W.; Olsen, Donald A.; Eacobacci, Michael J.; Harvell, John T.; Lepofsky, Robert J.; Roche, David E.; and Bender, Steven A., 4,918,930, Cl. 62-55.500.

Lermann, Peter: *See*—
Huber, Leonhard; Nagel, Erich; Payrhammer, Bernd; Lermann, Peter; Treiber, Helmut; and Wilsch, Herbert, 4,919,354, Cl. 242-67.30R.

Le Roux, Olivier: *See*—
Bachot, Jean; and Le Roux, Olivier, 4,919,772, Cl. 204-96.000.

Lescourret, Jean-Louis, to Crouzet (Socie te Anonyme francaise). Oscillator for measuring the ambient magnetic field. 4,920,317, Cl. 324-318.000.

Lesh, Stephen S.; and Waske, Herman J. Micrometer cartridge headspace gauge. 4,918,825, Cl. 33-506.000.

Lesur, Pierre; Faury, Christian; Lafleur, Guy; and Papillon, Andre , to Societe Chimique de la Grande Paroisse. Reactor for catalytic synthesis and process for using the reactor. 4,919,909, Cl. 423-360.000.

Leu, Ching-Baiu. Portable safety device combination for outdoor use. 4,918,775, Cl. 7-168.000.

Lever Brothers Company: *See*—
Kamel, Ahmed; Hurckes, Lisa C.; and Morelli, Monica M., 4,919,841, Cl. 252-186.260.

Levey, Idelle B.: *See—*
Levey, John; and Levey, Idelle B., 4,919,981, Cl. 428-26.000.
Levey, John; and Levey, Idelle B. Artificial horticultural product air freshener. 4,919,981, Cl. 428-26.000.
Levitt, Semond. Perspective drafting apparatus. 4,918,822, Cl. 33-432.000.
Levy, Julia G.; Dolphin, David; Chow, Jack K.; and Sternberg, Ethan, to University of British Columbia. Hydro-monobenzoporphyrin wavelength-specific cytotoxic agents. 4,920,143, Cl. 514-410.000.
Lewellen, Jim A. Garment protector. 4,919,081, Cl. 119-26.000.
Lewis, Michael D.: *See—*
Chang, Michael N.; Chiang, Yuan-Ching P.; Heck, James V.; Lewis, Michael D.; and Yang, Shu S., 4,920,106, Cl. 514-63.000.
Lewon, Wilhelm: *See—*
Knoll, Randall L.; Lewon, Wilhelm; and Ofstead, Ronald, 4,919,662, Cl. 623-6.000.
Leybold Aktiengesellschaft: *See—*
Reich, Gunter; and Worthington, William, 4,919,599, Cl. 417-423.400.
Voss, Gunter, 4,918,975, Cl. 73-40.700.
Leybold-Heraeus GmbH: *See—*
Dietrich, Anton; Hartig, Klaus; and Szczyrbowski, Joachim, 4,919,778, Cl. 204-192.270.
Rupp, Hartwig; and Stenzel, Otto, 4,919,187, Cl. 164-57.100.
Liao, Kuan Y.: *See—*
Chow, Yu C.; Liao, Kuan Y.; Chin, Maw-Rong; and Rhoades, Charles S., 4,920,403, Cl. 357-71.000.
Liberty Diversified Industries: *See—*
Stoll, Mark S., 4,919,267, Cl. 206-507.000.
Lickus, Leonard J.: *See—*
Bleuel, Eric P.; Ingwersen, Peter; Lickus, Leonard J.; Pellegrino, Thomas P.; Shah, Hasmukh; and Suthard, Robert A., 4,918,804, Cl. 29-33.00M.
Life-Link International, Inc.: *See—*
Harvey, Billy R.; and Rohrer, David W., 4,918,794, Cl. 24-429.000.
Likuski, Robert K.; and MacDonald, Scott N., to Beckman Instruments, Inc. Fluid delivery system with deficit flow compensation. 4,919,595, Cl. 417-18.000.
Limbert, Michael; Schrinner, Elmar; and Seibert, Gerhard, to Hoechst Aktiengesellschaft. Pharmaceutical formulation for the treatment of bacterial infections. 4,919,932, Cl. 424-114.000.
Lin, Chia-Cheng; and Milliron, Roger C., Jr., to PPG Industries, Inc. Forming glass fibers from sol-gel compositions. 4,919,871, Cl. 264-82.000.
Lin, Long-Jing. Ship-shaped video-tape rewinder. 4,919,357, Cl. 242-199.000.
Lin, Mei-Mei. Manufacturing process for making copper-plated aluminum wire and the product thereof. 4,919,769, Cl. 204-28.000.
Lin Pack Mouldings Limited: *See—*
Haines, Peter R., 4,919,299, Cl. 220-404.000.
Lin, Ying-wei; and Calarco, Anthony F., to Xerox Corporation. Offset, gain and bad pixel correction in electronic scanning arrays. 4,920,428, Cl. 358-461.000.
Lina, Marie-Jose; and Dessaint, Andre, to Atochem. Fluorinated carbamate polymers as hydrophobic and oleophobic agents. 4,920,190, Cl. 526-288.000.
Lindauer Dornier Gesellschaft mbH: *See—*
Dornier, Peter, 4,919,171, Cl. 139-435.100.
Riezler, Rudolf; and Wahhoud, Adnan, 4,919,172, Cl. 139-435.100.
Lindel, Hans; Hallenbach, Werner; and Berschauer, Friedrich, to Bayer Aktiengesellschaft. Substituted pyridylethanolamine livestock production promoters. 4,920,136, Cl. 514-344.000.
Linden, Unto, to Neste Oy. Fixed or sleeve-mounted spike, fitted on a vehicle tire. 4,919,180, Cl. 152-210.000.
Linden, Unto; and Suvanto, Erkki, to Neste Oy. Fixed spike or sleeve-mounted spike fitted on a vehicle tire. 4,919,181, Cl. 152-210.000.
Lindner, Christian: *See—*
Zabrocki, Karl; Lindner, Christian; Koch, Otto; and Braese, Hans-Eberhard, 4,920,178, Cl. 525-262.000.
Linear Integrated Systems, Inc.: *See—*
Hall, John H., 4,920,399, Cl. 357-42.000.
Linear Technology, Inc.: *See—*
Allen, Theresa M.; and Gabizon, Alberto, 4,920,016, Cl. 424-450.000.
Linero Pty. Ltd.: *See—*
Salkeld, William J., 4,918,909, Cl. 56-327.200.
Linotype AG: *See—*
Plaot, Michael, 4,919,501, Cl. 350-6.800.
Lipchak, John B.: *See—*
Gaussa, Louis W., Jr.; Graham, Kingsley F.; Lipchak, John B.; and Greenberg, Lesley, 4,920,548, Cl. 376-255.000.
Lipkin, Gregory M.; and Niedzwiecki, Joseph L., to Exxon Research and Engineering Company. Process for separating hydrocarbons. 4,919,794, Cl. 208-354.000.
Lipukhim, Jury V.; Danilov, Leonid I.; Garber, Eduard A.; and Subbotin, Anatoly N. Method for removing scale from a metal strip. 4,918,960, Cl. 72-40.000.
Liquid Container Corporation: *See—*
Keyser, Frank T., 4,919,879, Cl. 264-509.000.
Lissel, Ernst; and Holze, Raimond, to Volkswagen AG. Device operating on the doppler principle to determine the distance traveled by a vehicle. 4,920,345, Cl. 342-70.000.
Liszka, Kenneth J.; Dobruse, Daniel J.; Potopa, Steve E.; Gammill, Charles E.; and Gammill, Jerry D., to General Motors Corporation. Welding method for cylinder head repair. 4,918,805, Cl. 29-888.060.
Litherland, Troy C.: *See—*
Brazelton, Carl L.; Litherland, Troy C.; and Johnston, James G., 4,920,519, Cl. 366-161.000.
Littleton, Francis J., to Littleton Industrial Consultants, Inc. Sheet diverting and delivery system. 4,919,027, Cl. 83-107.000.
Littleton Industrial Consultants, Inc.: *See—*
Littleton, Francis J., 4,919,027, Cl. 83-107.000.
Litz, Lawrence M.; and Santalone, John J., Jr., to Union Carbide Industrial Gases Technology Corporation. Gas-liquid mixing process and apparatus. 4,919,849, Cl. 261-36.100.
Liu, Ju-Fu. Headphone type illuminating device with massage. 4,920,466, Cl. 362-105.000.
Livecchi, Paul M. Clamp type electric steam iron stand. 4,918,845, Cl. 38-142.000.
Livingston, Robert N.; and Kosteva, Michael, to Imagitek. AC high voltage power supply. 4,920,471, Cl. 363-22.000.
Lloyd, Grover. Rainfall control for irrigation systems. 4,919,165, Cl. 137-78.200.
Loewke, Daniel D.: *See—*
Loewke, Eunice R.; and Loewke, Daniel D., 4,919,479, Cl. 297-195.000.
Loewke, Eunice R.; and Loewke, Daniel D. Apparatus for carrying a passenger on a bicycle. 4,919,479, Cl. 297-195.000.
Lofquist, Robert A.: *See—*
Twilley, Ian C.; and Lofquist, Robert A., 4,919,997, Cl. 428-227.000.
Lofton, Hugh. Cold lubricant misting device and method. 4,919,232, Cl. 184-6.260.
Lohnherr, Ludger, to Krupp Polysius AG. Grinding method and grinding apparatus. 4,919,341, Cl. 241-18.000.
Long, Jeffrey L. Remotely controlled toy for capturing apparitions. 4,919,638, Cl. 446-490.000.
Long, John B. Conveyor belt cross-stream sampling system and associated method. 4,919,000, Cl. 73-863.910.
Longobardi, Cheryl A.: *See—*
Kirsh, Janet A.; Longobardi, Cheryl A.; and Kirsh, Thomas, 4,919,296, Cl. 220-85.00H.
Lorenzini, Robert E.: *See—*
Torbert, Walter; Struven, Kenneth C.; Lorenzini, Robert E.; and Bonora, Anthony C., 4,918,870, Cl. 51-131.300.
Lortz, Allan R.: *See—*
Bougher, Jerry D.; Anthony, James R.; Williams, Jeffrey L.; Homeier, Ronald F.; and Lortz, Allan R., 4,919,484, Cl. 297-474.000.
Los, Marinus; Ladner, David W.; and Cross, Barrington, to American Cyanamid. Intermediates for the preparation of (2-imidazolin-2-yl)thieno- and furo(2,3-b) and (3,2-b) pyridines. 4,920,226, Cl. 546-80.000.
Lotfi, Ali: *See—*
Catalanotti, Paul; and Lotfi, Ali, 4,919,608, Cl. 425-556.000.
Louw, John A.; Owens, William H.; and Luhm, Ralph, to Allfast Fastening Systems, Inc. Locking apparatus for blind fasteners. 4,919,576, Cl. 411-34.000.
Lovegrove, Claire J.; Rawlins, David A.; Phillips, Anthony J.; and Tainsh, David A., to Merck Sharp & Dohme Ltd. Sustained release pharmaceutical compositions in oral dosage form. 4,919,938, Cl. 424-480.000.
Lovelock, James E., to Hewlett-Packard Company. Method for purifying a continuous flow of helium and/or neon gas. 4,919,690, Cl. 55-2.000.
Lowes, Albert R., to Mydax Corporation. Compressor slugging prevention method for a refrigeration system. 4,918,931, Cl. 62-83.000.
Lubrizol Corporation, The: *See—*
Riga, Alan T.; and Forsberg, John W., 4,919,178, Cl. 149-2.000.
Lucas, Gordon H.: *See—*
Giles, Randy K.; and Lucas, Gordon H., 4,918,888, Cl. 52-233.000.
Lucas Industries PLC: *See—*
Extance, Philip; Hazelden, Roger J.; and Nutton, David, 4,919,099, Cl. 123-425.000.
Lucas Industries public limited company: *See—*
Brearley, Malcolm; and Moseley, Richard B., 4,920,493, Cl. 364-426.010.
Reynolds, Desmond H. J., 4,919,461, Cl. 285-174.000.
Urban, John A., 4,919,239, Cl. 188-216.000.
Luedtke, Charles W. Construction system for detention structures and multiple story buildings. 4,918,897, Cl. 52-747.000.
Luedtke, Gary D. Utility belt hook. 4,919,317, Cl. 224-151.000.
Luhm, Ralph: *See—*
Louw, John A.; Owens, William H.; and Luhm, Ralph, 4,919,576, Cl. 411-34.000.
Luksas, Anthony J.: *See—*
Ahmed, Salah H.; Kadlec, John D.; and Luksas, Anthony J., 4,919,960, Cl. 426-580.000.
Lumby, David; and Dawkins, Stephen, to McIlwraith Davey Pty. Ltd. Dishwasher. 4,919,162, Cl. 134-115.00R.
Lund, Jeffrey B.: *See—*
Smith, Redd H.; and Lund, Jeffrey B., 4,919,013, Cl. 76-108.200.
Lundblad, Arne, to Biocarb AB. Lacto-N-tetraose containing food-stuff and a process for its preparation. 4,919,961, Cl. 426-580.000.
Lundeen, Richard H.: *See—*
Incremona, Joseph H.; and Lundeen, Richard H., 4,919,994, Cl. 428-141.000.
Lundstrom, Bjorn; and Rex, Olle. High-rise building. 4,918,889, Cl. 52-234.000.

Lunenschloss, John T.; Ebbott, Henry M.; Beckeman, Raymond A.; and Gregerson, Glen M., to Air-Lec Industries, Inc. Variable speed door operator. 4,918,864, Cl. 49-137.000.

Luttinger, Johann: *See*—
Laimighofer, Johann; Garnweidner, Peter; Ublacker, Peter; and Luttinger, Johann, 4,919,473, Cl. 296-188.000.

Lutz, David L.; Meranda, Keith W.; and Minter, Russell B., to International Business Machines Corporation. Reusable evaporation fixture. 4,919,076, Cl. 118-721.000.

Lynch, William C.: *See*—
Binkley, Joseph H.; Caro, Perry A.; Dillon, John B.; Fay, Charles R.; Gibbons, Jonathan; Hooks, Hilary N.; Kadifa, Abdo G.; Lee, Jeffery W.; Lynch, William C.; Mock, Clayton W.; Neely, Everett T.; Tallan, Michael L.; Thompson, Geoffrey O.; Vukkadala, Gaya; Wick, John D.; and Woods, Donald R., 4,920,481, Cl. 364-200.000.

Lyons, Matthew V.: *See*—
Averill, Robert G.; Zarnowski, Alfred J.; and Lyons, Matthew V., 4,919,679, Cl. 623-23.000.

Lyons, Robin; S.: *See*—
Young, Michael E.; Edwards, David M.; and Lyons, Robin; S., 4,919,268, Cl. 206-509.000.

M & T Chemicals Inc.: *See*—
Conrad, Neal; Burchill, Michael T.; Silbermann, Joseph; Hoffman, Thomas; and Bourrel, Maurice, 4,919,972, Cl. 427-160.000.

Ma, Hansan, to Tonka Corporation. Curve ball. 4,919,422, Cl. 273-26.00R.

Mabee, Brian D.: *See*—
Leigh-Monstevens, Keith V., and Mabee, Brian D., 4,918,921, Cl. 60-545.000.

MacDonald, J. Gavin: *See*—
Nohr, Ronald S.; and MacDonald, J. Gavin, 4,920,168, Cl. 524-188.000.

MacDonald, Scott N.: *See*—
Likuski, Robert K.; and MacDonald, Scott N., 4,919,595, Cl. 417-18.000.

Machek, James E.: *See*—
Rhinehart, Edward; Machek, James E.; and Sanctis, Michael W., 4,919,146, Cl. 128-752.000.

Macht, Norbert: *See*—
Feller, Wolfgang; Macht, Norbert; and Bottrich, Johannes G., 4,920,194, Cl. 530-385.000.

MacKeron, Duncan H.: *See*—
Davey, Roger J.; and MacKeron, Duncan H., 4,920,092, Cl. 503-227.000.

Madsen, David C.: *See*—
Cotter, Richard; Johnson, Robert C.; Ward, Michael; Madsen, David C.; Valicenti, Anthony J.; Menard, Michael P.; and Tucker, Hugh N., 4,920,098, Cl. 514-2.000.

Maeda, Akira: *See*—
Kitagawa, Kunio; Maeda, Akira; and Matsumura, Yoshio, 4,919,614, Cl. 432-259.000.

Maeda, Hiroshi: *See*—
Cullen, Walter P.; Hauske, James R.; Kostek, Gloria J.; Maeda, Hiroshi; and Tone, Junsuke, 4,920,050, Cl. 435-119.000.
Holdom, Kelvin S.; Ruddock, John C.; Tone, Junsuke; Maeda, Hiroshi; and Jefson, Martin R., 4,920,215, Cl. 536-16.800.

Maeda Industries, Ltd.: *See*—
Iwasaki, Yoshihisa; and Akamatsu, Shogo, 4,919,378, Cl. 248-295.100.

Maeda, Katsuya: *See*—
Ishiguro, Yuji; Hosokawa, Hiroyuki; Koyama, Nobuhiko; Hiramatsu, Eiji; Takao, Mitsunori; Abe, Tomoaki; Kiyono, Masashi; Maeda, Katsuya; and Kamio, Shigeru, 4,919,103, Cl. 123-514.000.

Maeda, Shigemi: *See*—
Sakamoto, Noriaki; Nishioka, Yoshiki; Yamanaka, Toshihiro; Horie, Nobuyuki; Kobayashi, Shozou; Deguchi, Toshihisa; and Maeda, Shigemi, 4,920,528, Cl. 369-54.000.

Maeda, Takanori, to Pioneer Electronic Corp. Focusing error detection apparatus. 4,920,527, Cl. 369-45.000.

Maeda, Tatsumi: *See*—
Yoshida, Makoto; Sato, Masahiro; Koga, Kazunori; Osamura, Kazumi; Kousaka, Shoji; Maeda, Tatsumi; Yokoyama, Kiyoshi; and Matsunaka, Masafumi, 4,920,085, Cl. 501-97.000.

Magna-Graphics Corporation: *See*—
Terp, Gerald W.; and Stanek, Edward F., 4,919,352, Cl. 242-56.00A.

Magnaflex Associates Limited: *See*—
Houston, Stepher R., 4,919,419, Cl. 272-134.000.

Mahoney, Gregory P., to Eastman Kodak Company. Toner container lift mechanism. 4,920,381, Cl. 355-260.000.

Mahoney, Murray W.; and Holmes, Leslie M., Jr., to Rockwell International Corporation. Diffusion bonding nickel base alloys. 4,919,323, Cl. 228-157.000.

Maier, Franz: *See*—
Schindler, Erich; and Maier, Franz, 4,919,860, Cl. 264-29.100.

Maier, Gerhard; and Fischer, Betram, to Deutsche Thompson-Brandt GmbH. Radio frequency device circuit arrangement. 4,920,455, Cl. 361-424.000.

Majkrzak, Gerald A., to May Coating Technologies, Inc. Hot melt dispenser. 4,919,308, Cl. 222-146.500.

Mak, Stephen M., to Harvey, Larry B. Computer controlled, fully automatic, short-order wok cooking system for preparing stir-fried Chinese food. 4,919,950, Cl. 426-233.000.

Makino, Osamu. Bending tool. 4,918,971, Cl. 72-389.000.

Makiyo, Minoru; Goto, Shigenori; Yokosuka, Hiroshi; Curtis, Robert L.; and Wade, Philip J., to Fujikura Ltd.; and ALH Systems Limited. Sealing cable junctions. 4,920,236, Cl. 174-77.00R.

Makowka, Bernd: *See*—
Wehling, Bernhard; Makowka, Bernd; Klein, Heinz-Gunter, deceased; Klein, Gertrud, heir; and Rosentreter, Helga, 4,919,680, Cl. 8-94.270.

Malek, Charles J., to Motorola, Inc. Secure telephone terminal. 4,920,567, Cl. 380-33.000.

Mallari, Renato M. Process for improving products' quality and yields from delayed coking. 4,919,793, Cl. 208-131.000.

Manaka, Toshio; Shida, Masami; Sekozawa, Teruji; and Takahashi, Shinsuke, to Hitachi, Ltd. Engine control apparatus. 4,919,094, Cl. 123-326.000.

Manaka, Toshio; and Shida, Masami, to Hitachi, Ltd. Electronic throttle controlling apparatus for use in an internal combustion engine. 4,919,096, Cl. 123-399.000.

Manner, Walter, to Verwaltungsgesellschafft Geiger Plastic GmbH & Co. KG. Process for the joining of polyamide parts by friction welding. 4,919,987, Cl. 428-60.000.

Manning, Jeffrey L.; and Zurlippe, Clemens F., to Babcock & Wilcox Company, The. Retractable rolling mill instrumentation platform. 4,918,963, Cl. 72-199.000.

Manser, Aloysius H.; Strasilla, Dieter; and Mulhaupt, Rolf, to Ciba-Geigy Corporation. Epoxy resin compositions containing polyester flexibilizer and metallocene complex initiator. 4,920,182, Cl. 525-438.000.

Manska, Wayne E. Check valve. 4,919,167, Cl. 137-512.000.

Mansmaan, Manfred: *See*—
Wilhelm, Volker; and Mansmann, Manfred, 4,919,723, Cl. 106-441.000.

Mansson, Inge, to Eka Nobel AB. Process for bleaching. 4,919,755, Cl. 162-83.000.

Mantegani, Sergio: *See*—
Chiodini, Laura; Gobbini, Mauro; Mantegani, Sergio; Ruggieri, Daniela; Temperilli, Aldemio; Traquandi, Gabriella; and Ferrari, Patrizia, 4,920,099, Cl. 514-26.000.

Maquire, James H.: *See*—
Deuring, Hans; Maquire, James H.; Worsley, Clifford R.; and Whitehead, Martin J., 4,919,090, Cl. 123-90.670.

Maravetz, Lester L., to FMC Corporation. Haloalkyl triazolinones and herbicidal use thereof. 4,919,708, Cl. 71-92.000.

Marcorin, Franco: *See*—
Munini, Dino; and Marcorin, Franco, 4,919,385, Cl. 248-475.100.

Marcotte, Jacques: *See*—
Hachey, Raynald; Lamarre, Daniel; and Marcotte, Jacques, 4,918,974, Cl. 73-27.00R.

Mard, Matti; Vauhkonen, Vesa; and Kangasaho, Olavi, to ABB Stromberg Drives OY. Method for controlling the torque of a synchronous machine supplied by a frequency converter. 4,920,306, Cl. 318-722.000.

Mares, Frank: *See*—
Tang, Reginald T.; Mares, Frank; Boyle, William J., Jr.; Chiu, Tin-Ho; and Patel, Kundabhai M., 4,920,203, Cl. 525-409.000.

Maria Van Soom, Petrus L. A., to Avery International Corporation. Weldable microporous non-woven tape for medical applications. 4,919,999, Cl. 428-284.000.

Marier, Gregory J.; Warnke, Wayne L.; and Imai, Tetsuo, to Yamaha Hatsudoki Kabushiki Kaisha. Vehicle with steering-controlled torsion bar stabilizer. 4,919,441, Cl. 280-21.100.

Marine Terminals Corporation: *See*—
Riley, Robert E.; and McNeill, John, 4,919,283, Cl. 212-160.000.

Markov, Alexander; and Remington, James, to Markov, Alexander. Electric violin. 4,919,033, Cl. 84-726.000.

Markowicz, Marion, to American Cyanamid Company. Bubbler cylinder device. 4,919,304, Cl. 222-3.000.

Marley, Clement F.: *See*—
Spinner, Ralphael F., deceased; and Marley, Clement F., 4,918,785, Cl. 16-114.00B.

Marquip, Inc.: *See*—
Marschke, Carl R.; Thomas, Richard H.; and Wendorf, William D., 4,919,414, Cl. 271-227.000.

Marriott, Arthur R., to Physio-Control Corporation. Method and apparatus for sensing lead and transthoracic impedances. 4,919,145, Cl. 128-723.000.

Marschke, Carl R.; Thomas, Richard H.; and Wendorf, William D., to Marquip, Inc. Handling, including squaring, of conveyed shingled sheets. 4,919,414, Cl. 271-227.000.

Marsh, Frederick J. Maintaining an ice rink adjacent a side edge. 4,918,844, Cl. 37-197.000.

Marshall, Dennis L.: *See*—
Tiedemann, William H.; and Marshall, Dennis L., 4,919,284, Cl. 215-12.100.

Martensson, Nils E. V.; and Ashdown, Michael B., to Technophone Limited. Retractable antenna. 4,920,352, Cl. 343-702.000.

Martin, Andrew L., to Australian Telecommunication Corporation. Characterization of digital radio signals. 4,920,543, Cl. 375-10.000.

Martin, Gary L.: *See*—
Morgan, Steven J.; and Martin, Gary L., 4,919,255, Cl. 198-781.000.

Martin, Gerard M.; Claramonte, Manuel P.; Auffret, Jean-Claude; Bonnet, Guy M.; and Delarue, Jean-Jacques, to Aerospatiale Societe Nationale Industrielle. System for crystal growth, particularly for space vessel. 4,919,900, Cl. 422-245.000.

Martin, John W.: *See*—
Martin, William B.; Martin, John W.; and Bryan, Mark, 4,919,370, Cl. 248-56.000.

Martin, M. Warren; and Weber, Lawrence H., to R & B Machine Tool Company. Rotary blow molding machine having mold station blowing/neck finishing mechanisms. 4,919,607, Cl. 425-531.000.
Martin Marietta: *See*—
Zeigler, Henry J.; and Frisinger, Bruce L., 4,919,578, Cl. 411-113.000.
Martin, William B.; Martin, John W.; and Bryan, Mark. Cable fitting. 4,919,370, Cl. 248-56.000.
Martinez, Antonio E.; and Garcia, Eduardo C. Device for locating the epidural space. 4,919,653, Cl. 604-117.000.
Martinoli, Jean-Luc; Rousseau, Alain; and Vilain, Pascal, to Serbio. Device for measuring the modification time of the physical state of a fluid medium. 4,918,984, Cl. 73-64.100.
Martival S.A.: *See*—
Valdenaire, Jacques, 4,919,407, Cl. 269-118.000.
Marty, Jacques; Tremblet, Jerome; and Delorme, Jean-Jacques, to Crouzet. Universal electronic payment terminal base including memory card programming voltage booster. 4,920,256, Cl. 235-441.000.
Maruhashi, Yoshitsugu; Asai, Tamio; Iida, Setsuko; and Hirata, Sadao, to Toyo Seikan Kaisha, Ltd. Multilayer plastic container. 4,919,984, Cl. 428-36.400.
Maruhashi, Yoshitsugu: *See*—
Asai, Tamio; and Maruhashi, Yoshitsugu, 4,919,985, Cl. 428-36.600.
Marum, Steven E.: *See*—
Wise, Janet L.; and Marum, Steven E., 4,920,286, Cl. 307-542.000.
Maruta, Kiyoshi: *See*—
Iwanami, Takefumi; Maruta, Kiyoshi; Murota, Ichiya; and Miyazaki, Hiroshi, 4,919,936, Cl. 424-442.000.
Maruyama, Ryoji, to Kabushiki Kaisha Toshiba. Multiplier. 4,920,312, Cl. 324-141.000.
Maruyama, Takesuke: *See*—
Sano, Kenji; Maruyama, Takesuke; Satoh, Hironobu; Deguchi, Masaharu; and Murakami, Toshio, 4,920,420, Cl. 358-227.000.
Marx, Juergen; and Weich, Artur, to Siemens Aktiengesellschaft. Electronic digital timepiece having a separate key for controlling the switching of the display from standard to daylight savings time. 4,920,365, Cl. 368-242.000.
Marz, Daniel: *See*—
Robbins, Clyde; and Marz, Daniel, 4,920,566, Cl. 380-19.000.
Maschinenfabrik Rieter AG: *See*—
Briner, Emil; and Wehrli, Samuel, 4,918,913, Cl. 57-263.000.
Mascitelli, Edmund J.; and Riggs, Douglas J. Pipe cleaning head adapter. 4,919,558, Cl. 403-9.000.
Mashiko, Harumitsu; Seto, Takashi; and Suzuki, Shigeru, to Ricoh Company, Ltd. Image reproducing device. 4,919,531, Cl. 355-27.000.
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Masini, Jean-Jacques; and Chabidon, Rene , to Atochem. Device for sealingly mounting tubes which pass through a wall. 4,919,458, Cl. 285-110.000.
Masiulis, Joseph, to Motorola, Inc. Temperature dependent capacitor. 4,920,450, Cl. 361-282.000.
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Masuda, Toshiyuki, to Fuji Photo Film Co., Ltd. Information recording medium and process for producing the same. 4,919,988, Cl. 428-64.000.
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Mateias, Emil, to U.S. Philips Corporation. Method of cleaning metal components for cathode ray tubes. 4,919,157, Cl. 134-2.000.
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Matsui, Kazuhiro; and Kitagawa, Hiroji, to Kitagawa Industries Co., Ltd. Connection fitting for a corrugated tube. 4,919,462, Cl. 285-175.000.
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Matsukawa, Michimasa; Izumitani, Tetsuro; and Takeuchi, Kunio, to Hoya Corporation. Process of removing platinum inclusions from laser glass. 4,919,699, Cl. 65-134.000.
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Meijer, Robert S., to Fisher Scientific Company. Method and apparatus for monitoring the level of the contents in a container. 4,920,336, Cl. 340-619.000.
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Onishi, Janet C.; and Patchett, Arthur A., 4,920,112, Cl. 514-171.000.
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Miles, Ronald C.; Justice, David D.; and Woodard, Kenneth E., Jr., to Olin Corporation. Controlled operation of high current density oxygen consuming cathode cells to prevent hydrogen formation. 4,919,791, Cl. 204-98.000.
Millar, Edward A.; Harris, Gerald F.; and Fink, Roy G. Hip joint augmentation. 4,919,672, Cl. 623-22.000.
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Miller, Steven L., to Environmental Water Technology, Inc. Fluid reservoir structure for a fluid system. 4,919,301, Cl. 220-85.00S.
Miller, Steven L.; and Wathen, Ronald L., to Environmental Water Technology, Inc. Support structure for a fluid container. 4,919,375, Cl. 248-152.000.
Miller, William W.: *See*—
Yafuso, Masao; Hui, Henry K.; Yan, Cheng F.; and Miller, William W., 4,919,891, Cl. 422-58.000.
Milliken Research Corporation: *See*—
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Milliman, George E.: *See*—
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Milliron, Roger C., Jr.: *See*—
Lin, Chia-Cheng; and Milliron, Roger C., Jr., 4,919,871, Cl. 264-82.000.
Mills, Borden H.; and Cahill, David F., to Eastman Kodak Company. Fixing method for resin based sheets. 4,920,382, Cl. 355-284.000.
Miltz, Joseph; Strange, Robert A.; and McDilda, Joseph C., to Pillsbury Co., The. Refrigerated dough container. 4,919,949, Cl. 426-128.000.
Mima, Toshiyuki; and Shimizu, Hideki, to NGK Insulators, Ltd. Optical fiber-containing insulators and producing process thereof. 4,919,217, Cl. 174-139.000.
Min, Dong-Sun: *See*—
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Minagawa, Kiyohiko: *See*—
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Minarelli, Alessandro: *See*—
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Minaskanian, Gevork; and Peck, James V., to Nelson Research & Development Co. Compositions comprising 1-oxo- or thiohydrocarbyl substituted azacycloalkanes. 4,920,101, Cl. 514-24.000.
Minato, Shinichiro; and Nishino, Atsuo, to Fuji Photo Film Co., Ltd. Electrolytically treating method. 4,919,774, Cl. 204-129.400.
Mindick, Morris: *See*—
Patzelt, Robert R.; Meade, Robert J.; and Mindick, Morris, 4,919,691, Cl. 55-45.000.
Mingrone, Joseph A.: *See*—
Timothy, Earle J.; Jackson, Edward W.; Mingrone, Joseph A.; Jolie, Jeffrey W.; Nudelman, Dennis L.; and Howard, John F., 4,919,649, Cl. 604-65.000.
Minnesota Automation Inc.: *See*—
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Minnesota Mining and Manufacturing Company: *See*—
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Incremona, Joseph H.; and Lundeen, Richard H., 4,919,994, Cl. 428-141.000.
Knoll, Randall L.; Lewon, Wilhelm; and Ofstead, Ronald, 4,919,662, Cl. 623-6.000.
Yafuso, Masao; Hui, Henry K.; Yan, Cheng F.; and Miller, William W., 4,919,891, Cl. 422-58.000.
Minolta Camera Kabushiki Kaisha: *See*—
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Tominaga, Shinji; and Hashimoto, Takeshi, 4,920,373, Cl. 354-457.000.
Ueda, Masahide; and Hanada, Yoshihiro, 4,920,380, Cl. 355-219.000.
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Minster Machine Company, The: *See*—
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Minuto, Paul G. Vehicle jack. 4,919,392, Cl. 254-126.000.
Miser, Martin G. Apparatus for supplying gas to a patient. 4,919,132, Cl. 128-205.170.
Misic, George J.; Hurst, Gregory C.; Holland, G. Neil; Patrick, John L., III; and Orlando, Paul T., to Picker International, Inc. Surface coil system for magnetic resonance imaging. 4,920,318, Cl. 324-318.000.
Mitchell, Andrew C., to Scully Signal Company. Ring detector for telephone line. 4,920,561, Cl. 379-106.000.
Mitchell, Hal D., to American Protective Equipment, Inc. Clipboard ballistic shield. 4,919,037, Cl. 89-36.050.
Mitchell, Jerry L. Method for packaging perishable products. 4,919,955, Cl. 426-394.000.
Mito, Hideo: *See*—
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Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
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Ikuta, Yoshiaki; Moriwaki, Masayuki; and Kaneko, Masato, 4,919,207, Cl. 166-267.000.
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Mitsuhashi, Kepichi: *See*—
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Mitsui Petrochemical Industries, Ltd.: *See*—
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Mitui, Syuzi; Waki, Kouichirou; and Harada, Yasuhiro, to Mazda Motor Corporation. Engine output control system. 4,919,097, Cl. 123-399.000.
Miura Co., Ltd: *See*—
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Miyagishi, Tetsuya: *See*—
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Miyaishi, Yoshinori: *See*—
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Miyakawa, Akira: *See*—
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Miyakawa, Tadashi, to Fuji Photo Film Co., Ltd. Method for processing image signals so as to color correct them. 4,920,411, Cl. 358-80.000.
Miyama, Hiroshi: *See*—
Tomii, Kaoru; Miyama, Hiroshi; Kawauchi, Yoshikazu; and Nishida, Jun, 4,920,410, Cl. 358-67.000.
Miyamoto, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Nonvolatile semiconductor memory capable of readily erasing data. 4,920,512, Cl. 365-160.000.
Miyanaga, Masaaki, to Kabushiki Kaisha Miyanaga. Anchor construction and method of manufacture. 4,919,579, Cl. 411-55.000.
Miyashita, Toshiyuki: *See*—
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Miyata, Kunio: *See*—
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Miyazaki, Atsushi, to Olympus Optical Co., Ltd. Endoscope provided with flexible signal wires. 4,919,114, Cl. 128-6.000.
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Miyoshi Kasei Co. Ltd.: *See*—
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Miyoshi, Ryota; Imai, Isao; and Sugaya, Tadashi, to Miyoshi Kasei Co. Ltd. Polyolefin-treated pigment and cosmetics containing the same. 4,919,922, Cl. 424-63.000.
Mizoguchi, Akira; Shioya, Jun; Yamaguchi, Yoichi; and Ueba, Yoshinobu, to Director-General, Agency of Industrial Science and Technology. Method for producing electrically conductive carbon film. 4,919,779, Cl. 204-192.310.
Mizuguchi, Keiichi: *See*—
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Mizuno, Toru: *See*—
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Chen, Nai Y.; Garwood, William E.; Huang, Tracy J.; Le, Quang N.; and Wong, Stephen S., 4,919,788, Cl. 208-59.000.
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Mobley, Dewey F.; Peterson, Robert G., Sr.; and Mergless, James E., to Interlock Corporation. Tab receptacle with fixed beam contacts. 4,919,628, Cl. 439-858.000.
Mochizuki, Akira: *See*—
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Monstrey, Joost; and Wallaeys, Bart, to Recticel. Substantially closed cell shaped hard phenol foam and method for preparing that phenol foam. 4,920,154, Cl. 521-131.000.
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Monti, Roberto L., to Vetreria Parmense Bormioli Rocco S.p.A. Hermetic seal device for glass jars. 4,919,288, Cl. 215-284.000.
Moore, Bruce L.; and Cottam, Graham D., to H. R. Krueger Machine Tool Inc. Index table and method of alignment. 4,918,826, Cl. 33-645.000.
Moorman Manufacturing Company: *See*—
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Morgan, Steven J.; and Martin, Gary L., to Figgie International Inc. Zero pressure accumulating conveyor and module. 4,919,255, Cl. 198-781.000.
Morgan, Thomas K., Jr.; and Nickisch, Klaus, to Schering A.G. N-(aminoalkyl)-substituted(N or C alkyl)-aryl-4(methylsulfonylamino)-benzamides. 4,920,116, Cl. 514-210.000.
Mori, Akio; Watanabe, Kazuhiro; and Mochizuki, Shoichi, to Yazaki Corporation. Method of shaping plug receptacle. 4,918,813, Cl. 29-874.000.
Mori, Hideshi, to Koito Seisakusho Co., Ltd. Self-illuminated grill for motor vehicles. 4,920,460, Cl. 362-61.000.
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Mori, Toshihiro; and Tsunoda, Kazuyuki, to NEC Corporation. Antenna for portable radio communication apparatus. 4,920,353, Cl. 343-702.000.
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Morioka, Osamu; Tokushige, Keizo; Kimura, Akeo; and Nihei,-Takahiro, to Kabushiki Kaisha Kobe Seikosho; and Japan LSI Co., Ltd. Apparatus for testing IC devices at low temperature and cooling bag for use in testing IC devices at low temperature. 4,918,928, Cl. 62-51.100.
Morishita, Tadao, to Morishita Technical Laboratory. Method for transporting live fish. 4,919,079, Cl. 119-3.000.
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Morita, Shigeru, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for manufacturing a semiconductor device having a lens section. 4,920,075, Cl. 437-228.000.
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Morrison, Glenn E. Litter packaging system. 4,919,078, Cl. 119-1.000.
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Moser, Hans; and Vogel, Christian, to Ciba-Geigy Corporation. N-(1'-methyl-2'-methoxyethyl)-N-chloroacetyl-2,6-dimethylaniline as herbicide. 4,919,709, Cl. 71-118.000.
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Mottet, Leon-Philippe: *See*—
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Mozzi, Robert L.: *See*—
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MPDI, Inc.: *See*—
Rhodes, Michael L.; Kan, Ada; and Tivattanasuk, Eva, 4,920,573, Cl. 382-6.000.
Mroynski, Gerd, to Krone Aktiengesellschaft. Optical component for fiber-optical transmission systems. 4,919,503, Cl. 350-96.200.
MSC Technologies, Inc.: *See*—
Victor, Kenneth E.; and Goy, Carl A., 4,920,260, Cl. 250-221.000.
Mt. Holly, Inc.: *See*—
Kosik, Joseph F., Sr.; and Firestone, Bruce M., 4,919,331, Cl. 239-2.200.
Muccio, Philip E. Apparatus and method for transcutaneous electrical stimulation. 4,919,148, Cl. 128-798.000.
Muchisky, Thomas P.; and Young, James V., to Muchisky, Thomas P. Facial and body massage apparatus and method. 4,919,117, Cl. 128-62.00R.
Mucic, Vinko, to TCH Thermo-Consulting-Heidelberg GmbH. Binary solution compressive heat pump with solution circuit. 4,918,945, Cl. 62-502.000.
Muir, Dennis M. Crankshaft stand. 4,919,408, Cl. 269-296.000.
Mukai, Ryoichi, to Fujitsu Limited. Method for forming wirings for a semiconductor device by filling very narrow via holes. 4,920,070, Cl. 437-173.000.
Mukawa, Naoki: *See*—
Hatori, Yoshinori; Koga, Toshio; Matsuda, Kiichi; and Mukawa, Naoki, 4,920,426, Cl. 358-433.000.
Mulhaupt, Rolf: *See*—
Manser, Aloysius H.; Strasilla, Dieter; and Mulhaupt, Rolf, 4,920,182, Cl. 525-438.000.
Muller, Eberhard: *See*—
Obrechi, Werner; Wendling, Peter; Gobel, Wilhelm; and Muller, Eberhard, 4,920,189, Cl. 526-204.000.
Muller, Norbert: *See*—
Kaustrater, Gert; and Muller, Norbert, 4,919,038, Cl. 89-46.000.
Muller, Olaf, to R. Schmidt GmbH. Motor vehicle door panel. 4,919,470, Cl. 296-153.000.
Multiflow Computer, Inc.: *See*—
Colwell, Robert P.; O'Donnell, John; Papworth, David B.; and Rodman, Paul K., 4,920,477, Cl. 364-200.000.
Mund, Konrad: *See*—
Preidel, Walter; and Mund, Konrad, 4,919,770, Cl. 204-153.100.
Munini, Dino; and Marcorin, Franco, to Imago Fiama Sas di Pasquinelli Mauro & C. Structure to support a large mirror, and a large mirror employing that structure. 4,919,385, Cl. 248-475.100.
Murakami, Chikara; Nakajima, Atsushi; Hiyama, Hirokuni; Inanaga, Satoshi; and Watanabe, Katsuhide, to National Aerospace Laboratory; and Ebara Research Co., Ltd. Active magnetic bearing apparatus. 4,920,290, Cl. 310-90.500.
Murakami, Kanji. Atmosphere control apparatus for theaters. 4,919,197, Cl. 165-48.100.
Murakami, Kurenai, to NEC Corporation. Stuff synchronization circuit. 4,920,547, Cl. 375-112.000.
Murakami, Tokumichi; Kamizawa, Koh; and Kameyama, Masatoshi, to Mitsubishi Denki Kabushiki Kaisha. Digital signal processor. 4,920,480, Cl. 364-200.000.

Murakami, Toshibumi: *See*—
Hiraki, Hikosaburo; Murakami, Toshibumi; and Kusakabe, Akira, 4,919,093, Cl. 123-299.000.

Murakami, Toshio: *See*—
Sano, Kenji; Maruyama, Takesuke; Satoh, Hironobu; Deguchi, Masaharu; and Murakami, Toshio, 4,920,420, Cl. 358-227.000.

Muramatsu, Tadao; and Yamamuro, Shinichi, to Toyota Jidosha Kabushiki Kaisha; and Chuo Hatsujo Kabushiki Kaisha. Shift lever locking apparatus. 4,919,242, Cl. 192-4.00A.

Murano, Kazuo: *See*—
Iguchi, Kazuo; Soejima, Tetsuo; Murano, Kazuo; Amemiya, Shigeo; Komine, Hiroaki; Watanabe, Toshiaki; and Shinomiya, Tomohiro, 4,920,546, Cl. 375-106.000.

Muraoka, Hiroaki; and Miyashita, Toshiyuki, to Kabushiki Kaisha Toshiba. Dynamic latch circuit for preventing short-circuit current from flowing during absence of clock pulses when under test. 4,920,282, Cl. 307-442.000.

Muraoka, Masaaki: *See*—
Fujii, Satoru; Tanaka, Hiroaki; Furukawa, Takeshi; Muraoka, Masaaki; Narishima, Ryosuke; and Tamashige, Takamiki, 4,919,795, Cl. 209-135.000.

Muraoka, Shyuji: *See*—
Adachi, Ryoichi; and Muraoka, Shyuji, 4,919,474, Cl. 296-194.000.

Murata Manufacturing Co., Ltd.: *See*—
Takahashi, Hiroyuki; Yamamoto, Takashi; and Nakadachi, Takeo, 4,920,296, Cl. 310-348.000.

Murata, Shigemi: *See*—
Kodama, Seiki; and Murata, Shigemi, 4,919,106, Cl. 123-617.000.

Murata, Tomoji: *See*—
Ito, Masazumi; and Murata, Tomoji, 4,920,377, Cl. 355-55.000.

Muro, Hideo, to Nissan Motor Company, Limited. High sensitivity photodiode. 4,920,395, Cl. 357-30.000.

Murota, Ichiya: *See*—
Iwanami, Takefumi; Maruta, Kiyoshi; Murota, Ichiya; and Miyazaki, Hiroshi, 4,919,936, Cl. 424-442.000.

Murphy, Larry D.: *See*—
Bodurow, Constance C.; Murphy, Larry D.; and Perry, Gordon R., 4,918,879, Cl. 52-36.000.

Murphy, Robert J.: *See*—
Carnahan, Robert P.; and Murphy, Robert J., 4,919,814, Cl. 210-603.000.

Murray, Charles N.; and Jamet, Michel R., to European Atomic Energy Community (EURATOM). Submarine vehicle intended to measure data at the deep ocean sea-bottom. 4,919,065, Cl. 114-312.000.

Murray, Douglas G.; Smith, Dennis C.; and Guillet, James E., to Medipro Sciences Limited. Hydrogel-forming wound dressing or skin coating material. 4,920,158, Cl. 523-111.000.

Murray, Frank C.: *See*—
Sigl, Wayne C.; and Murray, Frank C., 4,919,835, Cl. 252-91.000.

Mutsakis, Michael: *See*—
Grosz-Roell, Fritz; Mutsakis, Michael; and Rader, Robert G., 4,919,541, Cl. 366-136.000.

Mydax Corporation: *See*—
Lowes, Albert R., 4,918,931, Cl. 62-83.000.

Nagai, Yoji: *See*—
Tateishi, Akitaka; Arakawa, Tadao; Kurosawa, Masaru; Kubo, Yoshifumi; and Nagai, Yoji, 4,920,276, Cl. 290-2.000.

Nagano, Masanobu: *See*—
Shiokawa, Youichi; Nagano, Masanobu; and Itani, Hiromichi, 4,920,129, Cl. 514-300.000.

Nagano, Masashi, to Shimano Industrial Company Limited. Speed change operating device. 4,919,004, Cl. 74-475.000.

Naganuma, Hisao: *See*—
Horikoshi, Tadao; Naganuma, Hisao; Sugimoto, Minoru; and Numao, Masanobu, 4,919,120, Cl. 126-93.000.

Nagase, Hidenobu: *See*—
Fujiyoshi, Yoshihiro; Nagase, Hidenobu; Fukuo, Koichi; and Aoki, Takatoshi, 4,919,089, Cl. 123-90.150.

Nagata, Takehumi; and Kimura, Tsutomu, to Fuji Photo Film Co., Ltd. Method of detecting noise in image signals. 4,920,267, Cl. 250-327.200.

Nagayoshi, Yoshimasa: *See*—
Hiramatsu, Takeo; Fujita, Kenjiro; Nagayoshi, Yoshimasa; Hirakushi, Shuzo; and Hamasaki, Yoshiaki, 4,919,248, Cl. 192-61.000.

Nagel, Erich: *See*—
Huber, Leonhard; Nagel, Erich; Payrhammer, Bernd; Lermann, Peter; Treiber, Helmut; and Wilsch, Herbert, 4,919,354, Cl. 242-67.30R.

Nagumo, Makoto: *See*—
Takeuchi, Hirosato; Tanaka, Yutaka; Miyazaki, Osahiko; Saito, Noboru; Kubo, Haruo; Kotake, Naoyuki; and Nagumo, Makoto, 4,918,969, Cl. 72-334.000.

Naik, Subhash K., to Avco Corporation. Method for imparting erosion-resistance to metallic substrates. 4,919,773, Cl. 204-38.400.

Najjar, Mitri S.: *See*—
Suggitt, Robert M.; and Najjar, Mitri S., 4,919,688, Cl. 48-69.000.

Nakada, Akio: *See*—
Nakamura, Ichiro; Shinkai, Naruto; Barlow, David; and Nakada, Akio, 4,920,413, Cl. 358-98.000.

Nakadachi, Takeo: *See*—
Takahashi, Hiroyuki; Yamamoto, Takashi; and Nakadachi, Takeo, 4,920,296, Cl. 310-348.000.

Nakagaki, Shintaro: *See*—
Takanashi, Itsuo; Nakagaki, Shintaro; Shinonaga, Hirohiko; Asakura, Tsutou; and Furuya, Masato, 4,920,417, Cl. 358-209.000.

Nakagawa, Hiroto: *See*—
Kuwabara, Takao; Nakagawa, Hiroto; and Kita, Eizo, 4,920,277, Cl. 290-40.00C.

Nakagawa, Kiyoshi, to Fuji Kogyo Kabushiki Kaisya. Videotape tape guide. 4,919,356, Cl. 242-199.000.

Nakagawa, Tadashi; Shinozaki, Nobuo; Koizumi, Hiroyuki; Yamazaki, Hiroshi; Saito, Hiroyuki; Matsushita, Katsuhiko; and Tanikawa, Miyoshi, to Seikosha Co., Ltd. Camera. 4,920,372, Cl. 354-412.000.

Nakagawa, Yukito: *See*—
Asamaki, Tatsuo; Mito, Hideo; Nakagawa, Yukito; and Sekiguchi, Atsushi, 4,919,783, Cl. 204-298.160.

Nakahama, Tadamitsu: *See*—
Yamane, Takakazu; Tanimoto, Yoshio; Nakahama, Tadamitsu; Aizawa, Makoto; and Kishimoto, Tsuneo, 4,919,977, Cl. 427-379.000.

Nakahashi, Masako: *See*—
Iyogi, Kiyoshi; Yasumoto, Takaaki; Yanazawa, Toshirou; Iwase, Nobuo; Nakahashi, Masako; and Takeda, Hiromitsu, 4,919,731, Cl. 148-24.000.

Nakai, Hitoshi: *See*—
Sangyoji, Kazuo; Yamamoto, Takemi; Okamoto, Tsugio; Hatta, Naoyuki; Asano, Yuji; Sakakibara, Kenji; Nakai, Hitoshi; Akao, Michitoshi; Sakai, Jun; and Matsumoto, Yumio, 4,920,374, Cl. 355-27.000.

Nakajima, Atsushi: *See*—
Murakami, Chikara; Nakajima, Atsushi; Hiyama, Hirokuni; Inanaga, Satoshi; and Watanabe, Katsuhide, 4,920,290, Cl. 310-90.500.

Nakakuki, Noboru; Oda, Kazuhide; Tagami, Masatoshi; Okino, Kouichi; Abe, Tomiya; and Ishibashi, Takanobu, to Hitachi Cable, Ltd. Plastic optical fiber. 4,919,513, Cl. 350-96.330.

Nakama, Yasunari; Harusawa, Fuminori; Otsubo, Kyoko; Iwai, Tsunehiko; Tamaki, Shuya; and Ohkoshi, Masahiro, to Shiseido Company Ltd. Detergent composition containing a quaternary ammonium cationic surfactant and a carboxylate anionic surfactant. 4,919,846, Cl. 252-542.000.

Nakamura, Hideo; and Sawase, Terumi, to Hitachi, Ltd. Semiconductor integrated circuit with nonvolatile memory. 4,920,518, Cl. 365-228.000.

Nakamura, Ichiro; Shinkai, Naruto; Barlow, David; and Nakada, Akio, to Olympus Optical Co., Ltd. Blood-vessel endoscope system for storing a frozen picture in synchronization with heart pulsation. 4,920,413, Cl. 358-98.000.

Nakamura, Kazuo: *See*—
Okada, Takao; Nakamura, Takeaki; Nakamura, Kazuo; Nishioka, Kimihiko; Kouchi, Toshihito; Yamamoto, Hiroyuki; and Tomabechi, Hideo, 4,919,520, Cl. 350-331.00T.

Nakamura, Kunie: *See*—
Kakimoto, Norihiro; Kumano, Kazuo; and Nakamura, Kunie, 4,919,917, Cl. 424-10.000.

Nakamura, Mitsuo, to Fuji Jukogyo Kabushiki Kaisha. Fuel injection control system for an automotive engine. 4,919,100, Cl. 123-492.000.

Nakamura, Soichiro: *See*—
Shimizu, Ichio; Hoshi, Akio; Okada, Sumio; and Nakamura, Soichiro, 4,920,074, Cl. 437-211.000.

Nakamura, Takeaki: *See*—
Okada, Takao; Nakamura, Takeaki; Nakamura, Kazuo; Nishioka, Kimihiko; Kouchi, Toshihito; Yamamoto, Hiroyuki; and Tomabechi, Hideo, 4,919,520, Cl. 350-331.00T.

Nakamura, Tsutomu: *See*—
Sasaki, Ryoichi; Nakamura, Tsutomu; Suzuki, Michio; Shinnai, Kohsuke; Ido, Nobuhiko; and Tsunoda, Tomoaki, 4,920,529, Cl. 370-16.000.

Nakanishi, Yasushi; Fukunaga, Takahiro; and Matsumoto, Manabu, to Sharp Kabushiki Kaisha. Image forming apparatus with a common power source for various chargers and a simplified arrangement for subjecting the photosensitive drum to blank exposure. 4,920,379, Cl. 355-210.000.

Nakano, Hiroyuki: *See*—
Yoshimi, Takani; Matsuura, Akihiro; Takashima, Toshiharu; and Nakano, Hiroyuki, 4,919,575, Cl. 409-231.000.

Nakano, Makoto, to Takatori Corporation; and Takatori Hitech C., Ltd. Apparatus for finishing pantyhose. 4,919,315, Cl. 223-76.000.

Nakano, Toshihiro; Sakata, Shinji; Ichioka, Hitoshi; Minagawa, Kiyohiko; and Iijima, Hideaki, to Aisin Seiki Kabushiki Kaisha. Master cylinder piston with intake valve and flow/resisting annular ring. 4,918,922, Cl. 60-589.000.

Nakao, Yukimichi; Kaeriyama, Kyoji; and Yamauchi, Aizo, to Agency of Industrial Science & Technology, Ministry of International Trade & Industry. Method for dissolution of metal. 4,919,716, Cl. 423-658.500.

Nakashima, Kiyoshi: *See*—
Kai, Hisao; and Nakashima, Kiyoshi, 4,919,272, Cl. 206-620.000.

Nakata, Akira: *See*—
Hosaka, Tohru; Mori, Shigeki; Ohya, Kunihiko; Matsumoto, Shiro; Nakata, Akira; Abe, Ichiro; and Hosaka, Naoto, 4,918,902, Cl. 53-403.000.

Nakata, Hiroya: *See*—
Sugiura, Saburo; Fujita, Senji; Nakata, Hiroya; Okamoto, Tetsuo; Inagaki, Yoshio; Mizuguchi, Keiichi; and Ishii, Atsushi, 4,919,714, Cl. 75-529.000.

Nakata, Mitsuhiko: *See*—
Yamamoto, Haruhiko; Suzuki, Masahiro; Udagawa, Yoshiaki; Nakata, Mitsuhiko; Katsuyama, Koji; Ono, Izumi; and Kikuchi, Shunichi, 4,920,574, Cl. 361-385.000.

Nakatani, Noboru: *See*—
Hosaka, Hideaki; Nakatani, Noboru; Aoki, Kiyotaka; and Shimaoka, Koichi, 4,919,959, Cl. 426-574.000.
Nakatani, Ryoichi: *See*—
Kobayashi, Toshio; Otomo, Shigekazu; Nakatani, Ryoichi; and Kumasaka, Noriyuki, 4,920,013, Cl. 428-694.000.
Nakatsukasa, Yasutaka: *See*—
Sato, Keiji; and Nakatsukasa, Yasutaka, 4,919,189, Cl. 164-137.000.
Nakaya, Masao; and Horiba, Yasutaka, to Mitsubishi Denki Kabushiki Kaisha. Integrated circuit device. 4,920,402, Cl. 357-68.000.
Nalco Chemical Company: *See*—
Fong, Dodd W.; Hoots, John E.; Johnson, Donald A.; and Kneller, James, 4,919,821, Cl. 210-698.000.
Patzelt, Robert R.; Meade, Robert J.; and Mindick, Morris, 4,919,691, Cl. 55-45.000.
Nalesnik, Theodore E.; and Herbstman, Sheldon, to Texaco Inc. Stable middle distillate fuel-oil compositions. 4,919,683, Cl. 44-62.000.
Nalesnik, Theodore E.; and Herbstman, Sheldon, to Texaco Inc. Stable middle distillate fuel-oil compositions. 4,919,684, Cl. 44-62.000.
Nalesnik, Theodore E.: *See*—
Herbstman, Sheldon; and Nalesnik, Theodore E., 4,919,685, Cl. 44-62.000.
Naley, Lowell B.: *See*—
Gustafson, Alan D.; Naley, Lowell B.; Christiansen, David A.; Hoium, Stanley O.; Harrington, Robert L.; Johnson, Dannis R.; and Truckenbrod, Gregory R., 4,918,932, Cl. 62-89.000.
Namiki, Tomizo: *See*—
Totsuka, Mikio; Shinozaki, Fumiaki; Wakata, Yuichi; and Namiki, Tomizo, 4,920,036, Cl. 430-270.000.
Nanostructures, Inc.: *See*—
Mauger, Philip E.; Shimkunas, Alex R.; and Yen, Junling J., 4,919,749, Cl. 156-643.000.
Naraki, Akihiro: *See*—
Abe, Masatoshi; Okamoto, Shin; and Naraki, Akihiro, 4,920,170, Cl. 526-247.000.
Narasimhan, Rajagopalan: *See*—
Yee, Jeng-Jung; and Narasimhan, Rajagopalan, 4,919,943, Cl. 426-39.000.
Nardulli, Elisa. Footwear fastener. 4,918,840, Cl. 36-50.000.
Narishima, Ryosuke: *See*—
Fujii, Satoru; Tanaka, Hiroaki; Furukawa, Takeshi; Muraoka, Masaaki; Narishima, Ryosuke; and Tamashige, Takamiki, 4,919,795, Cl. 209-135.000.
Narita, Yuichi, to Sanshin Dengu Manufacturing Co., Ltd. Mechanism for mounting a light source and a lamp tilting section of a searchlight. 4,920,468, Cl. 362-287.000.
Narukawa, Akira, to NGK Insulators, Ltd. Method of pretreating a sample for X-ray fluorescence analysis. 4,919,342, Cl. 241-25.000.
Naruse, Hiroshi; Takesada, Masashi; Hayaishi, Osamu; and Watanabe, Yasuyoshi, to Suntory Limited. Pharmaceutical composition and method for the treatment of infantile autism. 4,920,122, Cl. 514-254.000.
Nash, John, to Kensey Nash Corporation. Aortically located blood pumping catheter and method of use. 4,919,647, Cl. 600-16.000.
Nathenson, Richard D.: *See*—
Pavlik, Dennis; and Nathenson, Richard D., 4,919,192, Cl. 164-502.000.
National Aerospace Laboratory: *See*—
Murakami, Chikara; Nakajima, Atsushi; Hiyama, Hirokuni; Inanaga, Satoshi; and Watanabe, Katsuhide, 4,920,290, Cl. 310-90.500.
National Forge Company: *See*—
Khare, Ashok K., 4,919,735, Cl. 148-334.000.
National Research Development Corporation: *See*—
Cope, Richard E., 4,919,211, Cl. 172-69.000.
National Semiconductor Corporation: *See*—
Szepesi, Tamas S., 4,920,309, Cl. 323-269.000.
Natsuume, Tadao: *See*—
Ueda, Tsunehisa; Miyazaki, Kouji; and Natsuume, Tadao, 4,919,925, Cl. 424-76.100.
Navistar International Transportation Corp.: *See*—
Selzer, Robert J.; and Leitzman, Noel E., 4,919,399, Cl. 267-31.000.
Nawata, Hizuru, to NEC Corporation. Phase comparator. 4,920,278, Cl. 307-262.000.
Nazarov, Shaakhmed A.: *See*—
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NCR Corporation: *See*—
Henderson, David L.; and Stanchak, Carl M., 4,920,344, Cl. 341-118.000.
Isozaki, Hiromi; and Ito, Masakazu, 4,919,058, Cl. 109-24.100.
Neathery, David L.; and Owen, Harold E., II, to Neathery, David L. Manhole insert. 4,919,564, Cl. 404-25.000.
NEC Corporation: *See*—
Denda, Akira, 4,920,284, Cl. 307-475.000.
Hashiguchi, Tatsuro, 4,920,479, Cl. 364-200.000.
Hatori, Yoshinori; Koga, Toshio; Matsuda, Kiichi; and Mukawa, Naoki, 4,920,426, Cl. 358-433.000.
Ishijima, Toshiyuki, 4,920,397, Cl. 357-42.000.
Masuda, Hitoshi, 4,919,624, Cl. 439-76.000.
Mori, Toshihiro; and Tsunoda, Kazuyuki, 4,920,353, Cl. 343-702.000.
Murakami, Kurenai, 4,920,547, Cl. 375-112.000.
Nawata, Hizuru, 4,920,278, Cl. 307-262.000.
Sawada, Hachiro; Fujitsu, Tadashi; Takahashi, Ken-ichi; and Honma, Hideaki, 4,920,504, Cl. 364-521.000.
Takeda, Masahiro, 4,920,507, Cl. 364-724.170.
Neely, Everett T.: *See*—
Binkley, Joseph H.; Caro, Perry A.; Dillon, John B.; Fay, Charles R.; Gibbons, Jonathan; Hooks, Hilary N.; Kadifa, Abdo G.; Lee, Jeffery W.; Lynch, William C.; Mock, Clayton W.; Neely, Everett T.; Tallan, Michael L.; Thompson, Geoffrey O.; Vukkadala, Gaya; Wick, John D.; and Woods, Donald R., 4,920,481, Cl. 364-200.000.
Nelson, Bruce N., to Geo-Centers, Inc. Optical switch having birefringent element. 4,919,522, Cl. 350-389.000.
Nelson, Joyce K., to Union Carbide Industrial Gases Technology Corporation. Composite membranes of poly (methyl methacrylate) blends, their manufacture and their use. 4,919,865, Cl. 264-45.100.
Nelson Research & Development Co.: *See*—
Minaskanian, Gevork; and Peck, James V., 4,920,101, Cl. 514-24.000.
Nemoto, Tugio: *See*—
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Neogi, Amar N.: *See*—
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Neste Oy: *See*—
Linden, Unto, 4,919,180, Cl. 152-210.000.
Linden, Unto; and Suvanto, Erkki, 4,919,181, Cl. 152-210.000.
Nestec S.A.: *See*—
Palmlin, Peter; and Rudberg, Marianne, 4,919,953, Cl. 426-273.000.
Nestle S.A.: *See*—
Stoy, Michael A.; Dusek, Vaclav; Patel, Anilbhai S.; and Herriott, Ray G., 4,919,130, Cl. 606-107.000.
Nestler, John E.; Barlascini, Cornelius O.; Clore, John N.; and Blackard, William G., to Virginia Commonwealth University. Method of lowering LDL cholesterol in blood. 4,920,115, Cl. 514-178.000.
Neubauer, Hans-Jurgen; Seppelt, Wolfgang; Burstinghaus, Rainer; Hofmeister, Peter; and Kuenasi, Christoph, to BASF Aktiengesellschaft. Propargyl furan- and thiophenecarboxylates. 4,920,110, Cl. 514-438.000.
Neumann, Walter: *See*—
Schafer, Horst; Kossmehl, Gerhard; and Neumann, Walter, 4,920,184, Cl. 525-477.000.
Newbold, Dixon, to Rhode Gear USA. Tamper-resistant lock. 4,918,949, Cl. 70-38.00A.
Newman, Darrell F.; and Ross, Wayne A., to Battelle Memorial Institute. Radioactive waste material melter apparatus. 4,919,190, Cl. 164-250.100.
Newman, Donald J., to Ogden Industries Pty. Ltd. Lock mechanism. 4,918,953, Cl. 70-131.000.
Newman, Keith G., to Raychem Corporation. Method of making a flexible heater comprising a conductive polymer. 4,919,744, Cl. 156-308.200.
Newman, Neil A.; and Bowen, Thomas C., to Brunswick Corporation. Two turbine variable speed fluid coupling marine transmission. 4,919,009, Cl. 475-44.000.
Newton, Thomas H.; and Shimoda, Tatsuya, to Imperial Chemical Industries PLC; and Seiko Epson Corporation. Process for the production of a bonded magnet. 4,919,858, Cl. 264-24.000.
NGK Insulators, Ltd.: *See*—
Mima, Toshiyuki; and Shimizu, Hideki, 4,919,217, Cl. 174-139.000.
Narukawa, Akira, 4,919,342, Cl. 241-25.000.
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Bjork, Bengt A., 4,918,821, Cl. 33-203.180.
Nickisch, Klaus: *See*—
Morgan, Thomas K., Jr.; and Nickisch, Klaus, 4,920,116, Cl. 514-210.000.
Nicollini, Germano; and Senderowicz, Daniel, to SGS-Thomson Microelectronics S.p.A. Integrated active electronic switched capacitor filter having extremely low sensitivity to variations of the components. 4,920,325, Cl. 333-173.000.
Nicollini, Germano: *See*—
Senderowicz, Daniel; Torelli, Guido; and Nicollini, Germano, 4,920,510, Cl. 364-825.000.
Niedermaier, Arnold; and Weis, Anton, to Albert-Frankenthal AG. Web feed printing press. 4,919,049, Cl. 101-228.000.
Niedzwiecki, Joseph L.: *See*—
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Nielsen, Michael J. K., to Digital Equipment Corporation. Distributed arbitration apparatus and method for shared bus. 4,920,486, Cl. 364-200.000.
Niemi, Jouko, to Oy Finnpulva AB. Method and apparatus for improving the grinding result of a pressure chamber grinder. 4,919,339, Cl. 241-5.000.
Nienhaus, Gertrud: *See*—
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Nihei, Takahiro: *See*—
Morioka, Osamu; Tokushige, Keizo; Kimura, Akeo; and Nihei, Takahiro, 4,918,928, Cl. 62-51.100.
Niimura, Nagato: *See*—
Takahashi, Yasuhiko; Tamura, Kunimitsu; Niimura, Nagato; Asao, Keizo; Honoki, Teruyosi; Masui, Tadaaki; and Ishizaka, Masuo, 4,918,977, Cl. 73-40.50R.
Nikkanen, John P., to United Technologies Corporation. Prediffuser for a gas turbine engine. 4,918,926, Cl. 60-751.000.

Nikon Corporation: *See*—
Suzuki, Kazuaki, 4,920,505, Cl. 364-525.000.
Niles Parts Co., Ltd.: *See*—
Tsunoda, Masakazu; Inoue, Akimitsu; and Yamamoto, Tsutomu, deceased, 4,920,338, Cl. 340-825.300.
Ninomiya, Hiroshi: *See*—
Aouda, Yukio; Ninomiya, Hiroshi; Izu, Genichi; Yazawa, Yuichi; and Tachibana, Megumi, 4,919,919, Cl. 424-45.000.
Nippon Cable System Inc.: *See*—
Hirai, Shoichi, 4,918,865, Cl. 49-347.000.
Nippon Kayaku Kabushiki Kaisha: *See*—
Aouda, Yukio; Ninomiya, Hiroshi; Izu, Genichi; Yazawa, Yuichi; and Tachibana, Megumi, 4,919,919, Cl. 424-45.000.
Nippon Mektron Limited: *See*—
Abe, Masatoshi; Okamoto, Shin; and Naraki, Akihiro, 4,920,170, Cl. 526-247.000.
Nippon Paint Co., Ltd.: *See*—
Kanda, Kazunori; Ishikura, Shinichi; Ishii, Keizou; and Kashihara, Akio, 4,920,175, Cl. 525-110.000.
Kashihara, Akio; Otsuka, Chikayuki; and Ishikawa, Katsukiyo, 4,920,187, Cl. 526-193.000.
Nippon Seiko Kabushiki Kaisha: *See*—
Tsukada, Toru, 4,918,846, Cl. 384-15.000.
Nippon Sheet Glass Co., Ltd.: *See*—
Tada, Hiroaki; Yoshida, Harunobu; Kawahara, Hideo; and Miyata, Kunio, 4,919,521, Cl. 350-362.000.
Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See*—
Irie, Yoshio; Iwasaki, Kaoru; Hatsuda, Takumi; Kimura, Kazumasa; Harada, Nobuyuki; Ishizaki, Kunihiko; Shimomura, Tadao; and Fujiwara, Teruaki, 4,920,202, Cl. 528-500.000.
Nippon Telegraph and Telehpone Corp.: *See*—
Kimura, Takashi; Chihara, Kenichi; Tomatsu, Masahiro; Inoue, Kazunobu; Yano, Norio; and Adachi, Osamu, 4,920,441, Cl. 360-133.000.
Nippon Telegraph and Telephone Corporation: *See*—
Hatori, Yoshinori; Koga, Toshio; Matsuda, Kiichi; and Mukawa, Naoki, 4,920,426, Cl. 358-433.000.
Nippon Telegraph & Telephone Public Corp.: *See*—
Sakai, Tetsushi; Kobayasi, Yoshizi; Yamauchi, Hironori; and Arita, Yoshinobu, 4,920,401, Cl. 357-59.000.
Nippon Zeon Co., Ltd.: *See*—
Ueda, Tsunehisa; Miyazaki, Kouji; and Natsuume, Tadao, 4,919,925, Cl. 424-76.100.
Nippondenso Co., Ltd.: *See*—
Ishiguro, Yuji; Hosokawa, Hiroyuki; Koyama, Nobuhiko; Hiramatsu, Eiji; Takao, Mitsunori; Abe, Tomoaki; Kiyono, Masashi; Maeda, Katsuya; and Kamio, Shigeru, 4,919,103, Cl. 123-514.000.
Onose, Kazuhiko; and Ott, Willard B., 4,920,453, Cl. 361-392.000.
Nishi, Naomi; and Takahashi, Yosuke, to Ryobi Limited. Aluminum alloy for abrasion resistant die castings. 4,919,736, Cl. 148-416.000.
Nishida, Jun: *See*—
Tomii, Kaoru; Miyama, Hiroshi; Kawauchi, Yoshikazu; and Nishida, Jun, 4,920,410, Cl. 358-67.000.
Nishikido, Jyoji: *See*—
Yamamoto, Takuya; Fushimi, Fumiyoshi; and Nishikido, Jyoji, 4,919,809, Cl. 210-500.230.
Nishino, Atsuo: *See*—
Minato, Shinichiro; and Nishino, Atsuo, 4,919,774, Cl. 204-129.400.
Nishino, Tetsuo: *See*—
Isono, Osamu; Nishino, Tetsuo; and Iwabuchi, Eisuke, 4,920,531, Cl. 370-60.000.
Nishio, Ko: *See*—
Kurihara, Toshiyuki; Aomoto, Besso; and Nishio, Ko, 4,919,074, Cl. 118-697.000.
Nishioka, Kimihiko: *See*—
Okada, Takao; Nakamura, Takeaki; Nakamura, Kazuo; Nishioka, Kimihiko; Kouchi, Toshihito; Yamamoto, Hiroyuki; and Tomabechi, Hideo, 4,919,520, Cl. 350-331.00T.
Nishioka, Yoshiki: *See*—
Sakamoto, Noriaki; Nishioka, Yoshiki; Yamanaka, Toshihiro; Horie, Nobuyuki; Kobayashi, Shozou; Deguchi, Toshihisa; and Maeda, Shigemi, 4,920,528, Cl. 369-54.000.
Nishiura, Masaharu, to Fuji Electric Co., Ltd. Complementary field effect transistor and method of forming the same. 4,920,392, Cl. 357-23.700.
Nishiyama, Masanobu; Abe, Hitoshi; and Ochi, Yasuo, to Miura Co., Ltd. Time control device for water conditioning apparatus. 4,919,314, Cl. 222-643.000.
Nisihtani, Mikihiko: *See*—
Yukami, Noboru; Ikeda, Mitsusuke; Ohno, Masaharu; and Nisihtani, Mikihiko, 4,920,394, Cl. 357-30.000.
Nissan Motor Co., Ltd.: *See*—
Abe, Makoto; Tanimoto, Ichiro; Fujiki, Akira; Suzuki, Keitaro; Endo, Hiroyuki; and Ikenoue, Yutaka, 4,919,719, Cl. 75-243.000.
Abo, Toshimi; Satoh, Hiroshi; and Takahashi, Nobutaka, 4,920,494, Cl. 364-431.050.
Doi, Kazuhiro, 4,919,402, Cl. 267-140.100.
Hara, Junichiro; Ogihara, Yoshiyuki; and Mochizuki, Akira, 4,919,328, Cl. 236-49.300.
Higashimata, Akira; and Yasuno, Yoshiki, 4,919,494, Cl. 303-100.000.
Muro, Hideo, 4,920,395, Cl. 357-30.000.
Shinohara, Toshiro; Mihara, Teruyoshi; and Yao, Kenji, 4,920,396, Cl. 357-42.000.
Tabata, Toshiyuki; and Ishiyama, Tatsuro, 4,919,400, Cl. 267-140.100.
Tanino, Mikio, 4,919,195, Cl. 165-12.000.
Tsukamoto, Masahiro, 4,919,440, Cl. 280-707.000.
Tsunoda, Masakazu; Inoue, Akimitsu; and Yamamoto, Tsutomu, deceased, 4,920,338, Cl. 340-825.300.
Nissin Electric Co., Ltd.: *See*—
Nogawa, Shuichi; and Kamijo, Eiji, 4,920,094, Cl. 505-1.000.
Nitta, Tomio, to Tokai Corporation. Gas lighter. 4,919,610, Cl. 431-274.000.
Nittec Co., Ltd.: *See*—
Wakatake, Koichi, 4,919,887, Cl. 422-67.000.
Nitto Kohki Co., Ltd.: *See*—
Takeuchi, Hirosato; Tanaka, Yutaka; Miyazaki, Osahiko; Saito, Noboru; Kubo, Haruo; Kotake, Naoyuki; and Nagumo, Makoto, 4,918,969, Cl. 72-334.000.
Nixdorf Computer AG: *See*—
Weigel, Peter; Holland-Letz, Guenter; Ademmer, Heinz; and Nottelmann, Ulrich, 4,919,412, Cl. 271-110.000.
Noble, Kathleen H.: *See*—
Adams, Keith D.; Gruenbacher, Dana P.; and Noble, Kathleen H., 4,919,964, Cl. 426-564.000.
Nogawa, Shuichi; and Kamijo, Eiji, to Nissin Electric Co., Ltd. Process for producing superconducting thin films. 4,920,094, Cl. 505-1.000.
Noguchi, Kunio; Ueno, Masayuki; and Toshimits, Kazushige, to Honda Giken Kogyo Kabushiki Kaisha. Fuel supply control system for internal combustion engines. 4,919,101, Cl. 123-493.000.
Nohr, Ronald S.; and MacDonald, J. Gavin, to Kimberly-Clark Corporation. Stabilized siloxane-containing melt-extrudable thermoplastic compositions. 4,920,168, Cl. 524-188.000.
Nomura, Hiroaki: *See*—
Inoue, Keizo; Nomura, Hiroaki; and Imamiya, Eiko, 4,920,134, Cl. 544-316.000.
Nomura, Kyosuke: *See*—
Ebihara, Masaaki; and Nomura, Kyosuke, 4,918,988, Cl. 73-594.000.
Nonaka, Toshihisa; Kobayashi, Keisuke; Igaki, Hiroyuki; and Matsuki, Michiyasu, to Toray Industries, Inc. Fabrication of superconducting oxide thin films by sol-gel method. 4,920,093, Cl. 505-1.000.
Norcal Solid Waste Systems, Inc.: *See*—
Gardella, Peter; and Wood, Kevin L., 4,919,979, Cl. 428-2.000.
Nordenstroom, Bjorn. Method and apparatus for supplying electric energy to biological tissue for simulating the physiological healing process. 4,919,138, Cl. 128-421.000.
Nordica International, Inc.: *See*—
Willrett, Douglas L.; and Connotto, Michael, 4,919,942, Cl. 426-38.000.
Nordson Corporation: *See*—
Claasen, Henning J., 4,919,072, Cl. 118-666.000.
Normalair-Garrett (Holdings) Ltd.: *See*—
Stevenson, George F.; and Cassidy, Ronald F., 4,919,124, Cl. 128-202.260.
North American Philips Corporation: *See*—
Bruning, Gert W.; and Stupp, Edward H., 4,920,474, Cl. 363-97.000.
Motoyama, Tsutomu, 4,920,416, Cl. 358-198.000.
Northern Telecom Limited: *See*—
Strawczynski, Leo; and Steer, David G., 4,920,565, Cl. 380-6.000.
Northrop Corporation: *See*—
Komine, Hiroshi, 4,919,536, Cl. 356-28.500.
Norton, Richard C.: *See*—
Gartside, Robert J.; and Norton, Richard C., 4,919,898, Cl. 422-219.000.
Nottelmann, Ulrich: *See*—
Weigel, Peter; Holland-Letz, Guenter; Ademmer, Heinz; and Nottelmann, Ulrich, 4,919,412, Cl. 271-110.000.
Novak, Warren D., to Rank Video Services America. Magnetic tape cassette system. 4,920,436, Cl. 360-96.100.
Novo Industri A/S: *See*—
Diderichsen, Borge K., 4,920,048, Cl. 435-69.100.
Nowak, Gerhard; Winter, Alfred; Morbitzer, Hans P.; Theuer, Rudolf; and Kruschik, Klaus, to TMC Corporation. Heel piece for a safety ski binding including sink and detent mechanisms. 4,919,448, Cl. 280-618.000.
Nozaki, Masahiro: *See*—
Hayashi, Keizo; and Nozaki, Masahiro, 4,918,867, Cl. 49-490.000.
NTD Hiss Nartransportdon AB: *See*—
Karlsson, Klas; and Berqvall, Rune, 4,919,236, Cl. 187-25.000.
Nudelman, Dennis L.: *See*—
Timothy, Earle J.; Jackson, Edward W.; Mingrone, Joseph A.; Jolie, Jeffrey W.; Nudelman, Dennis L.; and Howard, John F., 4,919,649, Cl. 604-65.000.
Nujenko Pty. Ltd.: *See*—
Alter, Konrad G.; and Griffiths, Jennifer D., 4,919,652, Cl. 604-110.000.
NUKEM GmbH and ALKEM GmbH: *See*—
Konigs, Wilhelm; and Hrovat, Milan, 4,919,867, Cl. 264-57.000.
Nulman, Jaim; Bacile, Nick J.; and Blonigan, Wendell T., to AG Processing Technologies, Inc. Emissivity correction apparatus and method. 4,919,542, Cl. 374-9.000.
Numa Tool Company: *See*—
Pascale, Jack H., 4,919,221, Cl. 175-415.000.
Numao, Masanobu: *See*—
Horikoshi, Tadao; Naganuma, Hisao; Sugimoto, Minoru; and Numao, Masanobu, 4,919,120, Cl. 126-93.000.
Numbers, Jody L.: *See*—
Lakoski, Robert P.; and Numbers, Jody L., 4,918,952, Cl. 70-57.000.
Nunotani, Masao; and Matsumoto, Masaaki, to Koyo Seiko Co., Ltd. Bearing with improved lubrication seals. 4,919,551, Cl. 384-482.000.

Nurk, Seigfried, to SIPRA Patententwicklungs- u.Beteiligungsgesellschaft mbH. Thread feeder for knitting machines. 4,918,948, Cl. 66-132.00T.
Nutter, Norman E., to General Electric Company. Hydraulic turning gear. 4,919,039, Cl. 91-40.000.
Nutton, David: *See*—
Extance, Philip; Hazelden, Roger J.; and Nutton, David, 4,919,099, Cl. 123-425.000.
Nuyken, Oskar: *See*—
Budde, Klaus; Nuyken, Oskar; and Melchior, Walter, 4,920,038, Cl. 430-315.000.
O.N. Industries Co., Ltd.: *See*—
Yoshiro, Nakamura, 4,919,455, Cl. 285-23.000.
Obata, Takeo, to Ricoh Company, Ltd. Programmable logic array having an improved testing arrangement. 4,920,515, Cl. 365-189.080.
Obrecht, Werner; Wendling, Peter; Gobel, Wilhelm; and Muller, Eberhard, to Bayer Aktiengesellschaft. Process for the production of toluene-soluble, sulphur-modified chloroprene polymers. 4,920,189, Cl. 526-204.000.
O'Brien, Patrick J., to Container Corporation of America. Carton pouring device. 4,919,313, Cl. 222-541.000.
Occelli, Mario L., to Union Oil Company of California. Crystalline gallosilicate with the zeolite L type structure. 4,919,907, Cl. 423-326.000.
Occupant Safety Systems Inc.: *See*—
Doty, Gerald A.; and Johnson, Eric T., 4,919,450, Cl. 280-803.000.
Ochi, Yasuo: *See*—
Nishiyama, Masanobu; Abe, Hitoshi; and Ochi, Yasuo, 4,919,314, Cl. 222-643.000.
Ochiai, Kumi; Horie, Hiromichi; Arima, Itsuo; and Morita, Mikio, to Kabushiki Kaisha Toshiba. Compressed magnetic powder core. 4,919,734, Cl. 148-306.000.
Ochiai, Masami: *See*—
Ichiryu, Ken; Kanai, Takashi; Ochiai, Masami; and Ichiki, Nobuhiko, 4,919,390, Cl. 251-129.150.
Oda, Kazuhide: *See*—
Nakakuki, Noboru; Oda, Kazuhide; Tagami, Masatoshi; Okino, Kouichi; Abe, Tomiya; and Ishibashi, Takanobu, 4,919,513, Cl. 350-96.330.
Oda, Masao; Kobayashi, Toshiyuki; and Kinoshita, Yoshimi, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor producing apparatus. 4,919,077, Cl. 118-723.000.
Odanaka, Shinji: *See*—
Fuse, Genshu; Yamada, Toshio; Odanaka, Shinji; and Fukumoto, Masaki, 4,920,390, Cl. 357-23.600.
O'Donnell, John: *See*—
Colwell, Robert P.; O'Donnell, John; Papworth, David B.; and Rodman, Paul K., 4,920,477, Cl. 364-200.000.
Ofrex Group Holdings PLC: *See*—
Burlington, Geoffrey M.; and Watkins, Stephen C., 4,919,345, Cl. 241-36.000.
Ofstead, Ronald: *See*—
Knoll, Randall L.; Lewon, Wilhelm; and Ofstead, Ronald, 4,919,662, Cl. 623-6.000.
Ogami, Muneyuki; Kawasako, Yasuhiro; Otsuka, Takenori; Hiraoka, Tetsuo; and Hatamura, Koichi, to Mazda Motor Corporation. Intake system for V-type vehicle engine. 4,919,087, Cl. 123-52.0MV.
Ogata, Norio: *See*—
Shirota, Daigo; Omori, Masao; Yamato, Hiroyasu; and Ogata, Norio, 4,919,911, Cl. 423-499.000.
Ogawa, Souichi; Sugioka, Takao; and Inoue, Masaru, to Osaka Prefecture; and Koatsu Gas Kogyo Co. Ltd. Magnetic field shield including a superconductive film. 4,920,011, Cl. 428-596.000.
Ogawa, Yoshiyuki: *See*—
Watanabe, Yosuke; Kawakami, Yuji; Kikuchi, Koichiro; Ogawa, Yoshiyuki; and Sato, Hiroshi, 4,919,926, Cl. 424-81.000.
Ogden Industries Pty. Ltd.: *See*—
Newman, Donald J., 4,918,953, Cl. 70-131.000.
Ogihara, Yoshiyuki: *See*—
Hara, Junichiro; Ogihara, Yoshiyuki; and Mochizuki, Akira, 4,919,328, Cl. 236-49.300.
Ogilvie Mills, Inc.: *See*—
Bateson, George F.; Morris, Charles A.; and Heuer, Glenn C., 4,919,956, Cl. 426-465.000.
Ogino, Masanori; Kaiwa, Hiroshi; Iwahara, Yoshiaki; Tamura, Yuzo; and Yamamoto, Akio, to Hitachi, Ltd. Multi-screen projector. 4,919,518, Cl. 350-128.000.
Ogiwara, Takashi; Isono, Kesao; and Katagiri, Masahide, to Olympus Optical Co., Ltd. Coarse/fine adjustment coaxial handle for feeding microscope stage. 4,919,001, Cl. 74-10.520.
Ogura, Makoto; Kawai, Tatsundo; Yamada, Katsuhiko; and Seito, Shinichi, to Canon Kabushiki Kaisha. Image reading apparatus with jam-prevention feature. 4,920,431, Cl. 358-496.000.
Oh, Tae-Yup: *See*—
Hong, Pil-Young; Oh, Tae-Yup; Kim, Chun-Joong; and Kang, Sang-Suk, 4,920,066, Cl. 437-57.000.
Oh, Thomas S.: *See*—
Halling, Horace P.; and Oh, Thomas S., 4,919,453, Cl. 285-3.000.
Ohashi, Minoru; and Horii, Shoichi, to 501 Mitsubishi Paper Mills Limited. Method for processing silver halide photographic light-sensitive material. 4,920,043, Cl. 430-611.000.
Ohasi, Tamiyosi, to Toyoda Gosei Co., Ltd. Fuel injection port. 4,919,297, Cl. 220-86.00R.
Ohbori, Kouji: *See*—
Itoh, Hajime; Takahashi, Hiroshi; Ohbori, Kouji; and Habara, Hideaki, 4,919,810, Cl. 210-500.340.
Ohki, Nobutaka; Andoh, Kazuto; and Ishikawa, Takatoshi, to Fuji Photo Film Co., Ltd. Method for processing a silver halide color photographic material using a developer substantially free of benzyl alcohol and sulfite. 4,920,041, Cl. 430-380.000.
Ohkoshi, Masahiro: *See*—
Nakama, Yasunari; Harusawa, Fuminori; Otsubo, Kyoko; Iwai, Tsunehiko; Tamaki, Shuya; and Ohkoshi, Masahiro, 4,919,846, Cl. 252-542.000.
Ohmae, Tadayuki; Mashita, Kentaro; Yamaguchi, Noboru; Asao, Kouichiro; Kondo, Norio; and Sakurai, Tadashi, to Sumitomo Chemical Company, Limited. Aqueous dispersion of cationic polymer. 4,919,757, Cl. 162-164.300.
Ohmura, Kohki: *See*—
Okubo, Toshimitsu; Kobayashi, Kazuyoshi; Ohmura, Kohki; Sai, Yoshinobu; Satoh, Takuo; Yoshino, Yukihiko; Hoshi, Nobuyuki; Onodera, Takayuki; Endoh, Yasuo; Irokawa, Sigenobu; and Sannohe, Toshiaki, 4,919,045, Cl. 101-142.000.
Ohnishi, Toshikazu: *See*—
Arahara, Kohzoh; Fukumoto, Hiroshi; Yuasa, Toshiya; Ohnishi, Toshikazu; Kan, Fumitaka, deceased; Tanioka, Hiroshi; Koizumi, Norihiko; and Tohyama, Noboru, 4,920,361, Cl. 346-140.00R.
Ohno, Masaharu: *See*—
Yukami, Noboru; Ikeda, Mitsusuke; Ohno, Masaharu; and Nishitani, Mikihiko, 4,920,394, Cl. 357-30.000.
Ohno, Shigeru; Inagaki, Yoshio; Adachi, Keiichi; and Momoki, Yasuhito, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive elements containing water soluble dyestuffs. 4,920,031, Cl. 430-522.000.
Ohsawa, Jiro, to Win Lighter Corporation. Igniting apparatus. 4,919,111, Cl. 126-25.00B.
Ohsawa, Seiichi, to Pioneer Electronic Corporation. Fibre-type light conversion device. 4,919,511, Cl. 350-96.290.
Ohsumi, Yasuhisa: *See*—
Aoki, Tsuyoshi; and Ohsumi, Yasuhisa, 4,920,341, Cl. 341-15.000.
Ohta, Kenji: *See*—
Washo, Junichi; Terashima, Shigeo; Deguchi, Toshihisa; Horii, Masahiro; Hyuga, Takao; and Ohta, Kenji, 4,920,437, Cl. 360-99.050.
Ohta, Shinji: *See*—
Watanabe, Toshiaki; Iguchi, Kazuo; Soejima, Tetsuo; and Ohta, Shinji, 4,920,535, Cl. 370-105.100.
Ohya, Kunihiko: *See*—
Honma, Tohru; Mori, Shigeki; Ohya, Kunihiko; Matsumoto, Shiro; Nakata, Akira; Abe, Ichiro; and Hosaka, Naoto, 4,918,902, Cl. 53-403.000.
Oishi, Kengo; and Suzuki, Osamu, to Fuji Photo Film Co., Ltd. Method of molding magnetic tape cassette body half. 4,919,873, Cl. 264-130.000.
Oits Elevator Company: *See*—
Chicoine, Troy R., 4,919,227, Cl. 181-175.000.
Oka, Junichi: *See*—
Isono, Koichi; Towohisa, Kunio; Oka, Junichi; and Sakamoto, Takashi, 4,920,430, Cl. 358-481.000.
Okada, Mitsuhiro: *See*—
Takano, Yasunari; and Okada, Mitsuhiro, 4,920,245, Cl. 200-533.000.
Okada, Sumio: *See*—
Shimizu, Ichio; Hoshi, Akio; Okada, Sumio; and Nakamura, Soichiro, 4,920,074, Cl. 437-211.000.
Okada, Takao; Nakamura, Takeaki; Nakamura, Kazuo; Nishioka, Kimihiko; Koschi, Toshihito; Yamamoto, Hiroyuki; and Tomabechi, Hideo, to Olympus Optical Company. Liquid crystal eyeglass. 4,919,520, Cl. 350-331.00T.
Okamoto, Shin: *See*—
Abe, Masatoshi; Okamoto, Shin; and Naraki, Akihiro, 4,920,170, Cl. 526-247.000.
Okamoto, Tetsuo: *See*—
Sugiura, Saburo; Fujita, Senji; Nakata, Hiroya; Okamoto, Tetsuo; Inagaki, Yoshio; Mizuguchi, Keiichi; and Ishii, Atsushi, 4,919,714, Cl. 75-529.000.
Okamoto, Tsugio: *See*—
Sangyoji, Kazuo; Yamamoto, Takemi; Okamoto, Tsugio; Hatta, Naoyuki; Asano, Yuji; Sakakibara, Kenji; Nakai, Hitoshi; Akao, Michitoshi; Sakai, Jun; and Matsumoto, Yumio, 4,920,374, Cl. 355-27.000.
Okamoto, Yuji, to Sharp Kabushiki Kaisha. Copying machine with automatic document feeding means. 4,920,384, Cl. 355-311.000.
Okawa, Masayuki: *See*—
Tsujimura, Osamu; Arai, Tatsuo; and Okawa, Masayuki, 4,919,573, Cl. 407-40.000.
Okazaki, Kakuma; and Kitamura, Takayuki, to Japan Aircraft Mfg. Co., Ltd. Deployable and collapsible structure. 4,918,884, Cl. 52-108.000.
Oki Electric Industry Co., Ltd.: *See*—
Itoh, Masahiro, 4,920,389, Cl. 357-23.600.
Uchida, Hidetsugu, 4,920,391, Cl. 357-23.600.
Okino, Kouichi: *See*—
Nakakuki, Noboru; Oda, Kazuhide; Tagami, Masatoshi; Okino, Kouichi; Abe, Tomiya; and Ishibashi, Takanobu, 4,919,513, Cl. 350-96.330.
Okubo, Toshimitsu; Kobayashi, Kazuyoshi; Ohmura, Kohki; Sai, Yoshinobu; Satoh, Takuo; Yoshino, Yukihiko; Hoshi, Nobuyuki; Onodera, Takayuki; Endoh, Yasuo; Irokawa, Sigenobu; and Sannohe, Toshiaki, to Ricoh Company, Ltd. Offset printer having a press drum larger than its rubber drum. 4,919,045, Cl. 101-142.000.

Okuda, Shoji; and Uchida, Kazuo, to Kyoto Medical Science Laboratory. Detection of occult blood in feces. 4,920,045, Cl. 435-7.000.

Oldach, Uwe: *See*—
Ehluss, Heinz-Gunter; Wessel, Erich; and Oldach, Uwe, 4,919,064, Cl. 114-150.000.

Olin Corporation: *See*—
Miles, Ronald C.; Justice, David D.; and Woodard, Kenneth E., Jr., 4,919,791, Cl. 204-98.000.

Olive, Billy B.; and Williams, Clarence O. Insect trap for fleas or the like. 4,918,856, Cl. 43-113.000.

Oliver, Roy F.; and Jahoda, Colin A. B. Stimulation of hair growth. 4,919,664, Cl. 623-15.000.

Olivier, James P.; Kane, Mary F.; Orr, Clyde, Jr.; Laughinghouse, Charles L.; Wagner, Jack J.; and Tidwell, Samuel V., to Micromeritics Instrument Corporation. X-ray particle size analyzer. 4,920,550, Cl. 378-51.000.

Olney, Richard A. Electrostatic air cleaner. 4,919,693, Cl. 55-124.000.

Olsen, Donald A.: *See*—
Gaudet, Peter W.; Olsen, Donald A.; Eacobacci, Michael J.; Harvell, John T.; Lepoñsky, Robert J.; Roche, David E.; and Bender, Steven A., 4,918,930, Cl. 62-55.500.

Olson, John B.; Jeanson, Richard L.; and Sinchok, John D., to Fortec, Inc. Newspaper or other article vending device. 4,919,250, Cl. 194-248.000.

Olympus Optical Company: *See*—
Okada, Takao; Nakamura, Takeaki; Nakamura, Kazuo; Nishioka, Kimihiko; Kouchi, Toshihito; Yamamoto, Hiroyuki; and Tomabechi, Hideo, 4,919,520, Cl. 350-331.00T.

Olympus Optical Co., Ltd.: *See*—
Inoue, Yasuo; and Endo, Itaru, 4,920,053, Cl. 435-240.100.
Kaneko, Nobutaka, 4,920,498, Cl. 364-497.000.
Miyazaki, Atsushi, 4,919,114, Cl. 128-6.000.
Nakamura, Ichiro; Shinkai, Naruto; Barlow, David; and Nakada, Akio, 4,920,413, Cl. 358-98.000.
Ogiwara, Takashi; Isono, Kesao; and Katagiri, Masahide, 4,919,001, Cl. 74-10.520.

O'Malley, Gerard: *See*—
Kosley, Raymond W., Jr.; Cherill, Robert J.; and O'Malley, Gerard, 4,920,146, Cl. 514-437.000.

Omni Products International, Inc.: *See*—
Gibbs, Terence, 4,919,487, Cl. 297-445.000.

Omori, Masao: *See*—
Shirota, Daigo; Omori, Masao; Yamato, Hiroyasu; and Ogata, Norio, 4,919,911, Cl. 423-499.000.

Omron Tateisi Electronics Co.: *See*—
Mizuno, Masao, 4,920,340, Cl. 340-905.000.

O'Neil, Gregory R.: *See*—
Smith, Jay C.; McCord, Thomas H.; and O'Neil, Gregory R., 4,919,715, Cl. 75-423.000.

Ongari, Rua H., to Industria Plastica Ramos S.A. Machine bearing. 4,919,552, Cl. 384-492.000.

Onishi, Janet C.; and Patchett, Arthur A., to Merck & Co., Inc. Antifungal compositions and method of controlling mycotic infections. 4,920,109, Cl. 514-171.000.

Onishi, Janet C.; and Patchett, Arthur A., to Merck & Co., Inc. Fungicidal compositions and methods utilizing 25-azasterol and HMG-CoA reductase inhibitors. 4,920,111, Cl. 514-171.000.

Onishi, Janet C.; and Patchett, Arthur A., to Merck & Co., Inc. Fungicidal compositions and method. 4,920,112, Cl. 514-171.000.

Onishi, Janet C.; and Patchett, Arthur A., to Merck & Co., Inc. Fungicidal compositions and methods utilizing 25-azasterol and HMG-CoA synthase inhibitors. 4,920,113, Cl. 514-171.000.

Ono, Akira; and Iritani, Toshiro, to Ingersoll-Rand Company. Ratchet wrench. 4,919,022, Cl. 81-464.000.

Ono, Izumi: *See*—
Yamamoto, Haruhiko; Suzuki, Masahiro; Udagawa, Yoshiaki; Nakata, Mitsuhiko; Katsuyama, Koji; Ono, Izumi; and Kikuchi, Shunichi, 4,920,574, Cl. 361-385.000.

Ono, Kakuhisa: *See*—
Aizawa, Genya; and Ono, Kakuhisa, 4,919,469, Cl. 296-97.600.

Ono, Kouzi, to Konica Corporation. Silver halide photographic light-sensitive material for a laser light exposure. 4,920,040, Cl. 430-363.000.

Ono, Yoshiyuki: *See*—
Anazawa, Takanori; Hasumi, Kazuo; and Ono, Yoshiyuki, 4,919,856, Cl. 264-22.000.

Ono, Yuichi: *See*—
Takikawa, Kazunori; and Ono, Yuichi, 4,919,247, Cl. 192-58.00B.

Onoda Cement Company, Ltd.: *See*—
Fujii, Satoru; Tanaka, Hiroaki; Furukawa, Takeshi; Muraoka, Masaaki; Narishima, Ryosuke; and Tamashige, Takamiki, 4,919,795, Cl. 209-135.000.

Onodera, Takayuki: *See*—
Okubo, Toshimitsu; Kobayashi, Kazuyoshi; Ohmura, Kohki; Sai, Yoshinobu; Satoh, Takuo; Yoshino, Yukihiko; Hoshi, Nobuyuki; Onodera, Takayuki; Endoh, Yasuo; Irokawa, Sigenobu; and Sannohe, Toshiaki, 4,919,045, Cl. 101-142.000.

Onose, Kazuhiko; and Ott, Willard B., to Allen-Bradley Company, Inc.; and Nippondenso Company, Ltd. Programmable controller module. 4,920,453, Cl. 361-392.000.

Opitz, Rigobert: *See*—
Gobel, Ewald; Maurer, Dieter; and Opitz, Rigobert, 4,920,520, Cl. 367-99.000.

Oppelt, Ralph: *See*—
Duerr, Wilhelm; and Oppelt, Ralph, 4,920,522, Cl. 367-134.000.

Origin Medsystems, Inc.: *See*—
Chin, Albert K., 4,919,153, Cl. 606-93.000.

Orlando, Paul T.: *See*—
Misic, George J.; Hurst, Gregory C.; Holland, G. Neil; Patrick, John L., III; and Orlando, Paul T., 4,920,318, Cl. 324-318.000.

Orr, Avigdor; Spingler, John O.; and Gilbert, Seymour G., to DNA Plant Technology Corporation. Prolonging the shelf life of fresh root vegetables. 4,919,948, Cl. 426-106.000.

Orr, Clyde, Jr.: *See*—
Olivier, James P.; Kane, Mary F.; Orr, Clyde, Jr.; Laughinghouse, Charles L.; Wagner, Jack J.; and Tidwell, Samuel V., 4,920,550, Cl. 378-51.000.

Orsos, John H. Device for determing the operating temperature range of a spark plug. 4,918,827, Cl. 33-836.000.

Orthopedic Technology, Inc.: *See*—
Morris, John C., 4,919,118, Cl. 128-88.000.

Orthoplant Endioprothetick GmbH: *See*—
Schelhas, Klaus-Dieter, 4,919,674, Cl. 623-22.000.

Osada, Fusae: *See*—
Arai, Fuminori; and Osada, Fusae, 4,919,890, Cl. 422-56.000.

Osaka Gas Co., Ltd.: *See*—
Kato, Takashi; Morita, Yutaka; Yamaguchi, Takeshi; Tsuge, Kazuo; Imamura, Kyoji; Kawai, Yoshio; Hasegawa, Hiroaki; and Amemori, Hiroyuki, 4,918,996, Cl. 73-861.910.

Osaka Prefecture: *See*—
Ogawa, Souichi; Sugioka, Takao; and Inoue, Masaru, 4,920,011, Cl. 428-596.000.

Osamura, Kazumi: *See*—
Yoshida, Makoto; Sato, Masahiro; Koga, Kazunori; Osamura, Kazumi; Kousaka, Shoji; Maeda, Tatsumi; Yokoyama, Kiyoshi; and Matsunaka, Masafumi, 4,920,085, Cl. 501-97.000.

Osborn, Claiborn L.: *See*—
Koleske, Joseph V.; and Osborn, Claiborn L., 4,920,156, Cl. 522-31.000.

Osteonics Corp.: *See*—
Averill, Robert G.; Zarnowski, Alfred J.; and Lyons, Matthew V., 4,919,679, Cl. 623-23.000.

Ostermann & Scheiwe GmbH & Co. KG: *See*—
Hermann, Siegbert, 4,919,721, Cl. 106-34.000.

Otis Engineering Corporation: *See*—
Baker, Walter; and Council, Malcolm N., 4,919,204, Cl. 166-223.000.
Wong, Kwok-Ping, 4,919,456, Cl. 285-39.000.

Otomo, Shigekazu: *See*—
Kobayashi, Toshio; Otomo, Shigekazu; Nakatani, Ryoichi; and Kumasaka, Noriyuki, 4,920,013, Cl. 428-694.000.

Otsubo, Kyoko: *See*—
Nakama, Yasunari; Harusawa, Fuminori; Otsubo, Kyoko; Iwai, Tsunehiko; Tamaki, Shuya; and Ohkoshi, Masahiro, 4,919,846, Cl. 252-542.000.

Otsuka, Chikayuki: *See*—
Kashihara, Akio; Otsuka, Chikayuki; and Ishikawa, Katsukiyo, 4,920,187, Cl. 526-193.000.

Otsuka Kagaku Kabushiki Kaisha: *See*—
Imai, Tetsuya; and Takao, Hisashi, 4,920,142, Cl. 514-399.000.

Otsuka, Takenori: *See*—
Ogami, Muneyuki; Kawasako, Yasuhiro; Otsuka, Takenori; Hiraoka, Tetsuo; and Hatamura, Koichi, 4,919,087, Cl. 123-52.0MV.

Ott, Gunther: *See*—
Clark, Peter D.; Gilbert, John A.; Ott, Gunther; Ruhl, Dieter; and Santure, David J., 4,920,162, Cl. 523-400.000.

Ott, Karl-Heinz: *See*—
Schmidt, Adolf; Hendricks, Udo; Bomer, Bruno; Ott, Karl-Heinz; Eichenauer, Herbert; and Pischtschan, Alfred, 4,920,181, Cl. 525-327.500.

Ott, Willard B.: *See*—
Onose, Kazuhiko; and Ott, Willard B., 4,920,453, Cl. 361-392.000.

Otte, Donald R.; and Krueger, Steven E., to Cubic Designs Inc. Railing construction. 4,919,394, Cl. 256-65.000.

Outboard Marine Corporation: *See*—
Lathers, Michael W., 4,919,068, Cl. 114-363.000.

Owen, Harold E., II: *See*—
Neathery, David L.; and Owen, Harold E., II, 4,919,564, Cl. 404-25.000.

Owen, Hartley: *See*—
Harandi, Mohsen N.; Owen, Hartley; and Tabak, Samuel A., 4,919,896, Cl. 422-142.000.

Owen, Lindsey D.: *See*—
Hird, John A.; Owen, Lindsey D.; and Rice, Michael R., 4,920,558, Cl. 379-67.000.
Hird, John A.; Owen, Lindsey D.; and Rice, Michael R., 4,920,562, Cl. 379-132.000.

Owen, Richard A.; and Hannay, Richard C., to Team, Inc. Apparatus for composite pole repair. 4,918,883, Cl. 52-101.000.

Owens, Peter J.: *See*—
Fischer, Ronald H.; LaPierre, Rene B.; Owens, Peter J.; and Varghese, Philip, 4,919,789, Cl. 208-61.000.

Owens, William H.: *See*—
Louw, John A.; Owens, William H.; and Luhm, Ralph, 4,919,576, Cl. 411-34.000.

Oy Finnpulva AB: *See*—
Niemi, Jouko, 4,919,339, Cl. 241-5.000.

Pacesetter Infusion, Ltd.: *See*—
Slate, John B.; and Henke, James L., 4,919,596, Cl. 417-18.000.

Packaging Industries Group, Inc.: *See*—
Knaus, Dennis A., 4,919,864, Cl. 264-45.900.

Pagano, Raymond V. Ballistic rated camera housing and method for forming. 4,920,367, Cl. 354-81.000.

Page, Gary L., to Conoco Inc. Refractory supporting anchoring system. 4,918,894, Cl. 52-506.000.

Pak, Tae S.: *See*—
Pak, Tong S.; and Pak, Tae S., 4,919,946, Cl. 426-89.000.

Pak, Tong S.; and Pak, Tae S. Edible food product. 4,919,946, Cl. 426-89.000.

Palmlin, Peter; and Rudberg, Marianne, to Nestec S.A. Process for preparing a root vegetable coated and fried food product. 4,919,953, Cl. 426-273.000.

Paloma Kogyo Kabushiki Kaisha: *See*—
Ishiguro, Katsusuke, 4,919,085, Cl. 122-24.000.
Yokoyama, Nobuyoshi, 4,919,110, Cl. 126-394.000.

Panametrics, Inc.: *See*—
Fowler, Kenneth A.; Patch, Dana R.; and Hotchkiss, Frederick H., 4,918,990, Cl. 73-629.000.

Panduit Corp.: *See*—
Caveney, Jack E.; and Kuzmuk, Jeffery S., 4,919,373, Cl. 248-74.300.

Papillon, Andre : *See*—
Lesur, Pierre; Faury, Christian; Lafleur, Guy; and Papillon, Andre , 4,919,909, Cl. 423-360.000.

Papst-Motoren GmbH & Co. KG: *See*—
Albrecht, Klaus; Hans, Helmut; von der Heide, Johann; and Schmider, Fritz, 4,920,292, Cl. 310-114.000.

Papworth, David B.: *See*—
Colwell, Robert P.; O'Donnell, John; Papworth, David B.; and Rodman, Paul K., 4,920,477, Cl. 364-200.000.

Paragon Patent Development Inc.: *See*—
Consler, Donald; and Federico, Joseph B., 4,919,466, Cl. 294-170.000.

Parazak, Dennis P.; Burkhardt, Charles W.; and Langwald, Rainer, to Petrolite Corporation. Method for preventing the buildup of oily deposits on rolling mill scale. 4,918,959, Cl. 72-39.000.

Paren, Anthony R.: *See*—
Hoekwater, Mark A.; Paren, Anthony R.; Kasting, Thomas; and Rollins, Richard, 4,919,389, Cl. 251-6.000.

Paris, Sam: *See*—
Bartosiak, George; Siskovic, Christopher; Tap, Henry H.; Paris, Sam; and Goldberg, Arthur E., 4,919,505, Cl. 350-96.180.

Park, Hae-chul; Choi, Young-cha; Park, Kyung-dong; Park, Mi-ae; and Park, Kyu-dong. Method for the treatment of dental disease. 4,919,933, Cl. 424-196.100.

Park, Kyu-dong: *See*—
Park, Hae-chul; Choi, Young-cha; Park, Kyung-dong; Park, Mi-ae; and Park, Kyu-dong, 4,919,933, Cl. 424-196.100.

Park, Kyung-dong: *See*—
Park, Hae-chul; Choi, Young-cha; Park, Kyung-dong; Park, Mi-ae; and Park, Kyu-dong, 4,919,933, Cl. 424-196.100.

Park, Mi-ae: *See*—
Park, Hae-chul; Choi, Young-cha; Park, Kyung-dong; Park, Mi-ae; and Park, Kyu-dong, 4,919,933, Cl. 424-196.100.

Parrent, George B., Jr.; and Hauer, Harold, to Hercules Incorporated. Device and process for mixing a sample and a diluent. 4,920,060, Cl. 436-178.000.

Parsons, Mark N.; and Abba, Rodney L., to Kimberly-Clark Corporation. Process for softening webs. 4,919,877, Cl. 264-282.000.

Pasanen, Paavo: *See*—
Kankare, Jouko; Takalo, Harri; and Pasanen, Paavo, 4,920,195, Cl. 534-16.000.

Pascale, Jack H., to Numa Tool Company. Impact drill bit assembly and replaceable parts thereof. 4,919,221, Cl. 175-415.000.

Paschke, Robert A.; Mosel, James A.; Kratsch, Charles H.; White, Dean; and Edinger, Travis H., to Electric Avenue, Inc. Pay telephone enclosure. 4,918,878, Cl. 52-28.000.

Paschier, Bob. Process and apparatus for recovering meat from carcase sections in particular severed animal heads. 4,918,788, Cl. 17-46.000.

Pastva, John V., to Eastern Company, The. Door control mechanism. 4,918,866, Cl. 49-381.000.

Patch, Dana R.: *See*—
Fowler, Kenneth A.; Patch, Dana R.; and Hotchkiss, Frederick H., 4,918,990, Cl. 73-629.000.

Patchett, Arthur A.: *See*—
Onishi, Janet C.; and Patchett, Arthur A., 4,920,109, Cl. 514-171.000.
Onishi, Janet C.; and Patchett, Arthur A., 4,920,111, Cl. 514-171.000.
Onishi, Janet C.; and Patchett, Arthur A., 4,920,112, Cl. 514-171.000.
Onishi, Janet C.; and Patchett, Arthur A., 4,920,113, Cl. 514-171.000.

Patel, Anilbhai S.: *See*—
Stoy, Michael A.; Dusek, Vaclav; Patel, Anilbhai S.; and Herriott, Ray G., 4,919,130, Cl. 606-107.000.

Patel, Kundabhai M.: *See*—
Tang, Reginald T.; Mares, Frank; Doyle, William J., Jr.; Chiu, Tin-Ho; and Patel, Kundabhai M., 4,920,203, Cl. 525-409.000.

Patrick, John L., III: *See*—
Misic, George J.; Hurst, Gregory C.; Holland, G. Neil; Patrick, John L., III; and Orlando, Paul T., 4,920,318, Cl. 324-318.000.

Patron, Henri, to Societe Anonyme dite: Stein Industrie. Device for sealing and absorbing differential expansion between a chamber for cooling particles in suspension and a recycling duct. 4,919,198, Cl. 165-81.000.

Pattantyus, Imre A.: *See*—
Stoklosa, David P.; Pedicini, Christopher S.; and Pattantyus, Imre A., 4,920,019, Cl. 429-122.000.

Patton, Charles R., III: *See*—
Friend, Robert C.; and Patton, Charles R., III, 4,920,339, Cl. 340-825.520.

Patzelt, Robert R.; Meade, Robert J.; and Mindick, Morris, to Nalco Chemical Company. Paint detackification using an improved oil-in-water emulsion with dibasic ester. 4,919,691, Cl. 55-45.000.

Paulsen, Dean R., to General Scanning, Inc. Torsion bar scanner with damping. 4,919,500, Cl. 350-6.600.

Pavlik, Dennis; and Nathenson, Richard D., to Westinghouse Electric Corp. Discrete excitation coil producing seal at continuous casting machine pouring tube outlet nozzle/mold inlet interface. 4,919,192, Cl. 164-502.000.

Payne, Frederick C., to Midwest Water Resource, Inc. Portable on site soil treatment system. 4,919,570, Cl. 405-128.000.

Payrhammer, Bernd: *See*—
Huber, Leonhard; Nagel, Erich; Payrhammer, Bernd; Lermann, Peter; Treiber, Helmut; and Wilsch, Herbert, 4,919,354, Cl. 242-67.30R.

PC Connection, Inc.: *See*—
Cook, Gary M., 4,920,503, Cl. 364-521.000.

Pearce, Derry F.; Dimitriadis, Eugene; and Starkey, James R., to Godfrey Howden Pty. Ltd. Liquid testing apparatus. 4,918,979, Cl. 73-61.10R.

Pearman, Arthur N. J.; Hunter, Gerald D.; Woessner, Michael A.; and Gilman, Robert E., to Gas Research Institute. Electronic gas meter. 4,918,995, Cl. 73-861.020.

Pearson, Diane M., executor: *See*—
Pearson, Theodore S., deceased; and Pearson, Diane M., executor, 4,919,234, Cl. 187-9.00R.

Pearson, Theodore S., deceased; and by Pearson, Diane M., executor. Portable lift. 4,919,234, Cl. 187-9.00R.

Peck, James V.: *See*—
Minaskanian, Gevork; and Peck, James V., 4,920,101, Cl. 514-24.000.

Pecoraro, George A.; Shelestak, Larry J.; and Cooper, Joseph E., to PPG Industries, Inc. Vacuum refining of glassy materials with selected foaming rate. 4,919,697, Cl. 65-134.000.

Pecoraro, George A.; Shelestak, Larry J.; and Cooper, Joseph E., to PPG Industries, Inc. Vacuum refining of glassy materials with selected water content. 4,919,700, Cl. 65-134.000.

Peder, Olev I.: *See*—
Yarmashev, Jury N.; Zapandi, Vladimir A.; Tkachev, Valentin N.; and Peder, Olev I., 4,919,641, Cl. 460-69.000.

Pedersen, Henning: *See*—
Jensen, Hans C. S.; and Pedersen, Henning, 4,919,951, Cl. 426-241.000.

Pedicini, Christopher S.: *See*—
Stoklosa, David P.; Pedicini, Christopher S.; and Pattantyus, Imre A., 4,920,019, Cl. 429-122.000.

Peikin, Aaron J. Temperature measurement apparatus for use in recreational and sporting activities. 4,918,851, Cl. 43-1.000.

Peilloud, Fernand, to S. N. R. Roulementsi. Prosthetic knee joint with roller bearings. 4,919,660, Cl. 623-20.000.

Pell, Donald M. Endotracheal tube connector. 4,919,127, Cl. 128-207.140.

Pellegrino, Thomas P.: *See*—
Bleuel, Eric P.; Ingwersen, Peter; Lickus, Leonard J.; Pellegrino, Thomas P.; Shah, Hasmukh; and Suthard, Robert A., 4,918,804, Cl. 29-33.00M.

Pelletier, Jeffrey C.; Youssefyeh, Raymond D.; and Campbell, Henry F., to Rorer Pharmaceutical Corp. Substituted saturated and unsaturated indole quinoline and benzazepine carboxamides and their use as pharmacological agents. 4,920,219, Cl. 540-523.000.

Pelletier, Jeffrey C.; Youssefyeh, Raymond D.; and Campbell, Henry F., to Rorer Pharmaceutical Corp. Benzobicyclic carboxamide 5-HT3 antagonists. 4,920,227, Cl. 546-133.000.

Pencell Co., Ltd.: *See*—
Kuo, Chun-Liang, 4,919,556, Cl. 401-57.000.

Penney, Carl M.: *See*—
McLaughlin, Michael H.; Penney, Carl M.; and Sundell, Robert E., 4,920,249, Cl. 219-130.210.

Penning, Cornelis: *See*—
van der Heijden, Johannes M. A.; Derks, Pierre L. L. M.; and Penning, Cornelis, 4,920,297, Cl. 313-315.000.

Peppel, Michael, to BBC Brown Boveri AG. Method for protecting the gate unit for a GTO thyristor. 4,920,447, Cl. 361-93.000.

Pera, John D.; and Rayudu, S. Rao, to Buckman Laboratories International, Inc. 1-methyl-3,5,7-triaza-1-azoniatricyclodecane compounds, a method for preparing these compounds, and their use in the control of microorganisms in aqueous systems. 4,920,107, Cl. 514-244.000.

Perdriat, Jacques, to Acutronic France. System for automatically balancing a centrifuge in operation. 4,919,646, Cl. 494-1.000.

Perdriat, Jacques, to Acutronic France. Device for rotary-driving a centrifuge arm and method for power-feeding said device. 4,920,303, Cl. 318-161.000.

Periou, Pierre, to Rockwell-CIM. Motor-speed reducer device including safety means for driving an element. 4,918,998, Cl. 73-862.340.

Perkins, Cornelius C.: *See*—
Stopper, Herbert; and Perkins, Cornelius C., 4,920,454, Cl. 361-398.000.

Perkins, Sonnie J. Golf putter with blade tracking, twist prevention and alignment transfer structure, alignment maintaining structures, and audible impact features. 4,919,428, Cl. 273-164.000.

Perlman, Daniel, to Brandeis University. Liquid scintillation solution for measuring ^{222}RN in charcoal. 4,920,269, Cl. 250-364.000.

Perretta, Christine R. Protective case for a diver's face mask. 4,919,258, Cl. 206-5.000.

Perron, Marius R., III. Visual indicator of temporal accuracy of compared percussive transient signals. 4,919,030, Cl. 84-470.00R.

Perry, Gordon R.: *See*—
Bodurow, Constance C.; Murphy, Larry D.; and Perry, Gordon R., 4,918,879, Cl. 52-36.000.

Perry, John C. Hinge with leaves which reinforce one another against bending deflector. 4,918,786, Cl. 16-365.000.

Peterson, David: *See*—
Chen, Loren; van Buskirk, Gregory; Peterson, David; and Iliff, Robert J., 4,919,834, Cl. 252-90.000.

Peterson, Ray D.: *See*—
Davis, Dennis W.; Peterson, Ray D.; and Posey, Walter, Jr., 4,919,543, Cl. 374-139.000.

Peterson, Robert G., Sr.: *See*—
Mobley, Dewey F.; Peterson, Robert G., Sr.; and Mergless, James E., 4,919,628, Cl. 439-858.000.

Peterson, Ronald A.: *See*—
Lawson, James L.; and Peterson, Ronald A., 4,919,549, Cl. 384-113.000.

Petran, Mojmir; and Hadravsky, Milan, to Jednotne Zemedelske Druzstvo "Viteznv Unor" Se Sidlem V Komorne. Optical tandem scanning system using a koesters reflecting prism for light splitting. 4,919,516, Cl. 350-171.000.

Petri, Alberto, to Enichem Tecnoresine S.p.A. Branched polycarbonate from hydroxy-naphthoic acid or derivative, and process for preparing. 4,920,198, Cl. 528-201.000.

Petrolite Corporation: *See*—
Horstmann, Dennis G.; and Jones, Douglas S., 4,920,141, Cl. 514-398.000.
Parazak, Dennis P.; Burkhardt, Charles W.; and Langwald, Rainer, 4,918,959, Cl. 72-39.000.

Pettit, George D.: *See*—
Fossum, Eric R.; Kirchner, Peter D.; Pettit, George D.; Warren, Alan C.; and Woodall, Jerry M., 4,920,069, Cl. 437-90.000.

Peyer, Christof: *See*—
Buhl, Rainer; and Peyer, Christof, 4,919,968, Cl. 427-37.000.

Pfefferkorn, Earle L., to Greene Manufacturing Co. Gas burner element with universal supports. 4,919,116, Cl. 126-41.00R.

Pfefferle, William C. Method for clean incinertion of wastes. 4,918,915, Cl. 60-39.020.

Pfeiffer, Ernst F.: *See*—
Zier, Horst D.; Kerner, Wolfgang; and Pfeiffer, Ernst F., 4,919,141, Cl. 128-635.000.

Pfizer Inc.: *See*—
Cullen, Walter P.; Hauske, James R.; Kostek, Gloria J.; Maeda, Hiroshi; and Tone, Junsuke, 4,920,050, Cl. 435-119.000.
Eggler, James F.; Johnson, Michael R.; and Melvin, Lawrence S., Jr., 4,920,221, Cl. 544-125.000.
Glazer, Edward A., 4,920,224, Cl. 544-284.000.
Holdom, Kelvin S.; Ruddock, John C.; Tone, Junsuke; Maeda, Hiroshi; and Jefson, Martin R., 4,920,215, Cl. 536-16.800.

Pflanz, Herbert M., to G & W Electric Co. Pyrotechnically-assisted current interrupter. 4,920,446, Cl. 361-93.000.

Phaff, Fox, to Ciba-Geigy Corporation. Chromogenic 1-heterocyclic substituted 2,4-benzoxazines. 4,920,220, Cl. 544-90.000.

Pharmetrix Corporation: *See*—
Baker, Richard W., 4,919,939, Cl. 424-493.000.

Pharo, Daniel A. Method for forming clam-like packaging system. 4,918,904, Cl. 53-472.000.

Philippe, Francois. Differential detector of acoustic pressure. 4,920,332, Cl. 340-544.000.

Phillippe, Irenee J.: *See*—
Chupka, David E.; and Phillippe, Irenee J., 4,919,797, Cl. 209-273.000.

Phillips, Anthony J.: *See*—
Lovegrove, Claire J.; Rawlins, David A.; Phillips, Anthony J.; and Tainsh, David A., 4,919,938, Cl. 424-480.000.

Phillips, Kenneth A., to American Tourister, Inc. Merchandising system. 4,919,280, Cl. 211-87.000.

Phillips Petroleum Company: *See*—
Boston, Ernest B., 4,919,840, Cl. 252-182.300.
Kolts, John W., 4,920,088, Cl. 502-326.000.

Phillips, Richard E., Jr.; and Spehr, Paul R., to Intermedics, Inc. Triaxial electrode. 4,919,135, Cl. 128-419.00P.

Physio-Control Corporation: *See*—
Marriott, Arthur R., 4,919,145, Cl. 128-723.000.

Picker International, Inc.: *See*—
Misic, George J.; Hurst, Gregory C.; Holland, G. Neil; Patrick, John L., III; and Orlando, Paul T., 4,920,318, Cl. 324-318.000.

Pierce, Joseph B. System for cleaning whirlpool baths. 4,919,160, Cl. 134-100.000.

Pierrat, Michel A. Method for grinding trochoidal and circular bearing races. 4,918,862, Cl. 51-105.0EC.

Pigiet, Vincent P., to Repligen Corporation. Use of thioredoxin, thioredoxin-derived, or thioredoxin-like dithiol peptides in hair care preparations. 4,919,924, Cl. 424-72.000.

Pilger, Friedhelm; Kopp, Richard; and Ganster, Otto, to Bayer Aktiengesellschaft. Process for the production of polyurethane-and/or polyurea-based moldings. 4,919,878, Cl. 264-300.000.

Pilkington, Donald J., to GFM Holdings AG. Sheet cutting machine. 4,920,495, Cl. 364-474.370.

Pillsbury Co., The: *See*—
Miltz, Joseph; Strange, Robert A.; and McDilda, Joseph C., 4,919,949, Cl. 426-128.000.

Pine, Stanley H.: *See*—
Grubbs, Robert H.; Coots, Robert J.; and Pine, Stanley H., 4,919,151, Cl. 128-898.000.

Pinkston, Margarita: *See*—
Pinkston, Mark C.; and Pinkston, Margarita, 4,919,035, Cl. 89-14.300.

Pinkston, Mark C.; and Pinkston, Margarita. Muzzle brake and tool for installation. 4,919,035, Cl. 89-14.300.

Pioneer Electronic Corporation: *See*—
Hasegawa, Shinichi; and Hanyu, Masaaki, 4,919,515, Cl. 350-128.000.
Hosaka, Sumio; Amaya, Toshiyuki; Daito, Toshiji; Itoh, Hiroshi; and Jinguji, Takumi, 4,920,424, Cl. 358-343.000.
Maeda, Takanori, 4,920,527, Cl. 369-45.000.
Ohsawa, Seiichi, 4,919,511, Cl. 350-96.290.
Yoshio, Junichi, 4,920,569, Cl. 381-61.000.

Pirdzuns, Rolf, to Vorwerk & Co. Interholding GmbH. Current supply arrangement for household appliances and method of making the same. 4,920,456, Cl. 361-428.000.

Pirkey, Arla. Decorative ornament and method of making same. 4,919,980, Cl. 428-4.000.

Pischinger, Franz; Spicher, Ulrich; and Heuser, Georg, to FEV Motorentechnik GmbH & Co. KG. Device for measuring and transmitting the combustion radiation in the combustion chamber of combustion engines. 4,918,982, Cl. 73-116.000.

Pischtschan, Alfred: *See*—
Schmidt, Adolf; Hendricks, Udo; Bomer, Bruno; Ott, Karl-Heinz; Eichenauer, Herbert; and Pischtschan, Alfred, 4,920,181, Cl. 525-327.500.

Pitalo, Stephen K.; Walden, Donnie T.; and Lay, Henry P., to Boeing Company, The. Boresight alignment verification device. 4,919,528, Cl. 350-620.000.

Pizza Hut, Inc.: *See*—
Bingham, Lynn R.; and Henke, Jerome R., 4,919,477, Cl. 296-24.100.

Plant, Howard L.: *See*—
Blem, Allen R.; Plant, Howard L.; and Regis, Richard R., 4,919,703, Cl. 71-86.000.

Plaot, Michael, to Linotype AG. Opto-mechanical deflector. 4,919,501, Cl. 350-6.800.

Platt, Alan: *See*—
Twist, Michael; and Platt, Alan, 4,919,372, Cl. 248-56.000.

Plough, Inc.: *See*—
McShane, James E., 4,919,954, Cl. 426-308.000.

Plozner, Lisio, to B.P.T. S.p.A. Mercury inertial transducer and light-emitting indicator for motor vehicles. 4,920,330, Cl. 340-467.000.

Plumb, Arnold D. Apparatus for detecting oil and other lighter-than-water contaminants in an effluent stream. 4,919,892, Cl. 422-58.000.

Pneumatech, Inc.: *See*—
Fresch, Vincent P.; Mathews, Titus; and Rossi, Anthony R., 4,918,939, Cl. 62-272.000.

Podgers, Alexander R., to Emco Wheaton, Inc. Fuel dispensing nozzle with built-in flow regulator. 4,919,305, Cl. 222-55.000.

Podlipnik, Kalman. Three-stage mercury switch for operation between the heating and cooling mode. 4,919,196, Cl. 165-26.000.

Podosek, Edward, to Dennison Manufacturing Company. Looseleaf binder with sliding lock mechanism. 4,919,557, Cl. 402-41.000.

Poels, Eduard K.: *See*—
Van Beek, Wilhelmus P.; Den Hoed, Wilma; Van Leeuwen, Willem A.; Poels, Eduard K.; and Visser, Cornelis, 4,920,089, Cl. 502-335.000.

Pogue, Michael A.; Dempsey, Morgan J.; Shah, Shreyaunsh R.; and Waible, Leo C., III, to Data General Corporation. A computer memory for accessing any word-sized group of contiguous bits. 4,920,483, Cl. 364-200.000.

Pohjola, Jukka K. Screw cap opener. 4,919,015, Cl. 81-3.440.

Pohl, Helmut: *See*—
Kohl, Heinz; Pohl, Helmut; and Puchl, Alois, 4,919,728, Cl. 148-12.00B.

Policastro, Peter P.: *See*—
Langer, Matthew E.; Policastro, Peter P.; and Shultz, Allan R., 4,920,191, Cl. 528-26.000.

Poling, Ronald W., to General Electric Company. Method of operating an electric circuit controlling device. 4,920,240, Cl. 200-83.00P.

Poly-John Enterprises Corp.: *See*—
Harding, George W., 4,918,765, Cl. 4-460.000.

Polyplastics Co., Ltd.: *See*—
Hayashi, Noriyuki; and Hijikata, Kenji, 4,920,197, Cl. 528-190.000.

Pomeroy, Dan M.: *See*—
Sears, Stephan B.; and Pomeroy, Dan M., 4,919,592, Cl. 415-207.000.

Poorter, Tiemen: *See*—
Hartgring, Cornelis D.; Dikken, Jan; and Poorter, Tiemen, 4,920,287, Cl. 307-542.000.

Popik, Matthew G.: *See*—
Gachet, Beston W.; Hunstman, Dennis C.; Popik, Matthew G.; and Taylor, Robert W., 4,919,176, Cl. 144-134.00D.

Popitz, Michael D., to Brigham and Women's Hospital. Medical support pillow. 4,918,774, Cl. 5-441.000.

Portals Engineering Limited: *See*—
Eagle, Christopher R., 4,919,747, Cl. 156-497.000.

Porter Cable Corporation: *See—*
Gachet, Benton W.; Hunstman, Dennis C.; Popik, Matthew G.; and Taylor, Robert W., 4,919,176, Cl. 144-134.00D.

Posey, Walter, Jr.: *See—*
Davis, Dennis W.; Peterson, Ray D.; and Posey, Walter, Jr., 4,919,543, Cl. 374-139.000.

Potopa, Steve E.: *See—*
Liszka, Kenneth J.; Dobruse, Daniel J.; Potopa, Steve E.; Gammill, Charles E.; and Gammill, Jerry D., 4,918,805, Cl. 29-888.060.

Pouillange, Jean, to CGEE Alsthom. Vernier torquemeter. 4,918,997, Cl. 73-862.340.

Poulas, Peter W. Liquid filled jump rope. 4,919,417, Cl. 272-75.000.

Powel, Stephen S.; and Darby, Robert J., to Powel, Stephen S.; and Darby, Robert J. Reusable high speed winding tube. 4,919,359, Cl. 242-125.100.

Poynton, Christopher H.; and Reading, Christopher L., to University of Texas System, The. Biological magnetic colloids. 4,920,061, Cl. 436-526.000.

PPG Industries, Inc.: *See—*
Demarest, Henry M., Jr., 4,920,080, Cl. 501-31.000.
Gillery, Frank H., 4,920,006, Cl. 428-432.000.
Jensen, Thomas H., 4,920,274, Cl. 250-561.000.
Knavish, Leonard A., 4,919,698, Cl. 65-134.000.
Lin, Chia-Cheng; and Milliron, Roger C., Jr., 4,919,871, Cl. 264-82.000.
Pecoraro, George A.; Shelestak, Larry J.; and Cooper, Joseph E., 4,919,697, Cl. 65-134.000.
Pecoraro, George A.; Shelestak, Larry J.; and Cooper, Joseph E., 4,919,700, Cl. 65-134.000.

Pratt, Kenneth H.: *See—*
Caron, James O.; Pratt, Kenneth H.; and Genger, Richard D., 4,919,566, Cl. 404-121.000.

Precision Fabrics Group: *See—*
Goad, Conrad D.; and Taylor, Jeffrey L., 4,919,998, Cl. 428-265.000.

Preedy, John E.: *See—*
Bowley, Heather J.; Gerrard, Donald L.; and Preedy, John E., 4,919,533, Cl. 356-36.000.

Preidel, Walter; and Mund, Konrad, to Siemens Aktiengesellschaft. Method for determining the concentration of electro-chemically convertible substances. 4,919,770, Cl. 204-153.100.

Presz, Michael; and Dela Rosa, Guy, to General Electric Company. Push-pull fluorescent dimming circuit. 4,920,299, Cl. 315-98.000.

Prevorsek, Dusan C.: *See—*
Das, Sajal; Prevorsek, Dusan C.; Rhee, Seong K.; and Bulger, William J., 4,920,159, Cl. 523-153.000.

Prime Computer, Inc.: *See—*
Albonesi, David, 4,920,539, Cl. 371-40.200.

Princeton University, The Trustees of: *See—*
Taylor, Edward C.; Harrington, Philip M.; and Shih, Chuan, 4,920,125, Cl. 514-272.000.

Principe, Frank S.: *See—*
Hopkins, Mark W.; and Principe, Frank S., 4,919,490, Cl. 301-63.0PW.

Procter & Gamble Company, The: *See—*
Adams, Keith D.; Gruenbacher, Dana P.; and Noble, Kathleen H., 4,919,964, Cl. 426-564.000.
Ball, W. Kenneth; Goulait, David J. K.; and Zorb, James E., 4,919,738, Cl. 156-73.500.
Heckert, David C., 4,919,963, Cl. 426-599.000.
McNeil, Kevin B., 4,919,351, Cl. 242-56.00R.
Sawdai, Albert H., 4,919,756, Cl. 162-111.000.

Proprietary Technology, Inc.: *See—*
Bartholomew, Donald D., 4,919,403, Cl. 267-165.000.

Proulx, Stephen; and Rowe, Paul. Motor vehicle emergency tire traction improvement device consisting of polymeric rope. 4,919,182, Cl. 152-221.000.

Pruitt, Merrill L.: *See—*
Jarzombek, Richard E.; Moeller, Raymond J., Jr.; and Pruitt, Merrill L., 4,920,199, Cl. 528-272.000.

Pryor, Timothy R.: *See—*
Clarke, Donald A.; Reynolds, Rodger L.; and Pryor, Timothy R., 4,920,385, Cl. 356-237.000.

Puchl, Alois: *See—*
Kohl, Heinz; Pohl, Helmut; and Puchl, Alois, 4,919,728, Cl. 148-12.00B.

Purdue Research Foundation: *See—*
Borgens, Richard B.; and McGinnis, Michael E., 4,919,140, Cl. 128-422.000.
Regnier, Frederick E.; and Kopaciewicz, William, 4,920,152, Cl. 521-31.000.

Pyzik, Aleksander J.; Schwarz, Douglas B.; Dubensky, William J.; and Beaman, Donald R., to Dow Chemical Company, The. Self-reinforced silicon nitride ceramic of high fracture toughness. 4,919,689, Cl. 51-309.000.

Quality Products, Inc.: *See—*
Born, Gerald W., 4,919,311, Cl. 222-401.000.

Quantum Corporation: *See—*
Brown, David A.; Daniels, Donald V.; and Harrison, Joel N., 4,920,434, Cl. 360-77.080.
Dimmick, Walter S., 4,920,442, Cl. 360-137.000.

Quinn, Candace J.: *See—*
Beall, George H.; and Quinn, Candace J., 4,920,081, Cl. 501-47.000.

Quinn, David E.: *See—*
Hoke, Duane E.; Kimball, Ronald L.; and Quinn, David E., 4,919,510, Cl. 350-96.210.

Qvintus, Harri T.: *See—*
Kokkonen, Seppo K.; and Qvintus, Harri T., 4,919,158, Cl. 134-15.000.

R & B Machine Tool Company: *See—*
Martin, M. Warren; and Weber, Lawrence H., 4,919,607, Cl. 425-531.000.

R. Maag AG: *See—*
Dorn, Silvia, 4,919,935, Cl. 424-405.000.

R. Schmidt GmbH: *See—*
Muller, Olaf, 4,919,470, Cl. 296-153.000.

Raath, Pieter L.: *See—*
Ver Loren van Themaat, Hendrik M.; and Raath, Pieter L., 4,920,331, Cl. 340-541.000.

Raccioppi, Michael G., Jr. Work table for sheet metal brakes. 4,918,966, Cl. 72-319.000.

Rachner, Horst: *See—*
Buhler, Roland; Erdelitsch, Herbert; Hecht, Walter; and Rachner, Horst, 4,920,239, Cl. 200-61.540.

Rademachers, Jakob; and Wilhelm, Volker, to Bayer Aktiengesellschaft. Process for the production of rutile mixed-phase pigments. 4,919,726, Cl. 106-428.000.

Rader, Robert G.: *See—*
Grosz-Roell, Fritz; Mutsakis, Michael; and Rader, Robert G., 4,919,541, Cl. 366-136.000.

Radermacher, Herbert: *See—*
Vanaschen, Luc; Kuster, Hans W.; and Radermacher, Herbert, 4,918,946, Cl. 65-104.000.

Raffo, John A.: *See—*
DeCamp, Howard S.; Raffo, John A.; and Bimanand, Alex Z., 4,920,254, Cl. 219-547.000.

Rajala, Raimo: *See—*
Ruottu, Reijo; Rajala, Raimo; Jokioinen, Ilkka; and Ahlskog, Sture, 4,918,828, Cl. 34-4.000.

Rakov, David M.: *See—*
Goebel, William K.; and Rakov, David M., 4,920,356, Cl. 346-1.100.

Ramsey, Henry C.: *See—*
Tyler, Robert A.; Ramsey, Henry C.; and Armstrong, Robert N., 4,919,681, Cl. 8-116.100.

Ramsey, Lawrence W.: *See—*
Aul, Raymond J.; Howell, Robert L.; and Ramsey, Lawrence W., 4,919,882, Cl. 376-293.000.

Rana, Avtar Singh; and Gandiglio, Romolo, to Fiat Auto S.p.A. Motor vehicle with a device for the release of the fuel tank in the event of a violent impact to the rear. 4,919,226, Cl. 180-274.000.

Ranade, Abhiram G., to Yale University. Multiprocessor/memory interconnection network wherein messages sent through the network to the same memory are combined. 4,920,484, Cl. 364-200.000.

Rand, Rick A.: *See—*
Jaffe, Robert S.; Lavin, Mark A.; Rand, Rick A.; and Schreiner, Paul, 4,920,429, Cl. 358-471.000.

Rand, Robert S.: *See—*
Benson, Richard E.; Gavrilos, Andrew D.; Rand, Robert S.; Shaw, Scott M.; Spafford, Joel W.; and Walko, Ronald J., 4,920,305, Cl. 318-657.000.

Rank Video Services America: *See—*
Novak, Warren D., 4,920,436, Cl. 360-96.100.

Raschbichler, Hans G.: *See—*
Wcislo, Manfred; Raschbichler, Hans G.; Miller, Luitpold; and Breitenbach, Otto, 4,918,835, Cl. 29-732.000.

Rask, Rodney B.: *See—*
Krieger, Roger B.; and Rask, Rodney B., 4,919,088, Cl. 123-65.00A.

Rasmussen, Hans Kristian L., to Sanovo Engineering A/S. Apparatus for the breaking of eggs and their separation into yolk and albumen. 4,919,042, Cl. 99-499.000.

Ratner, Buddy D.: *See—*
Horbett, Thomas A.; Ratner, Buddy D.; Chinn, Joseph A.; and Haque, Yasmeen, 4,919,659, Cl. 623-1.000.

Rauser, Bernard; and Harth, Robert, to Audi Ag. Manually extendable telescoping antenna. 4,920,354, Cl. 343-901.000.

Rawlins, David A.: *See—*
Lovegrove, Claire J.; Rawlins, David A.; Phillips, Asthony J.; and Tainsh, David A., 4,919,938, Cl. 424-480.000.

Ray, Ranjan: *See—*
Yang, Choong-Jin; and Ray, Ranjan, 4,919,732, Cl. 148-103.000.

Raychem Corporation: *See—*
Mercer, Frank, 4,920,005, Cl. 428-411.100.
Newman, Keith G., 4,919,744, Cl. 156-308.200.

Rayne, Mark W.: *See—*
Brier, Geoffrey; and Rayne, Mark W., 4,920,511, Cl. 364-900.000.

Raythatha, Rasik H.; Tatarchuk, Bruce; and Lee, Woo Y. Mixed pillared clay reduction products and method of preparation. 4,920,086, Cl. 502-63.000.

Raytheon Company: *See—*
Schloemann, Ernst F. R. A.; Blight, Ronald E.; and Mozzi, Robert L., 4,920,323, Cl. 333-1.100.

Rayudu, S. Rao: *See—*
Pera, John D.; and Rayudu, S. Rao, 4,920,107, Cl. 514-244.000.

Reading, Christopher L.: *See—*
Poynton, Christopher H.; and Reading, Christopher L., 4,920,061, Cl. 436-526.000.

Reafler, Gerald G., to Eastman Kodak Company. Continuous method for making decorative sheet materials. 4,918,800, Cl. 29-527.200.

Reale, Louis, to Xerox Corporation. Corona generating device. 4,920,266, Cl. 250-324.000.

Reamer, Robert A.: *See*—
Askin, David; Jones, Todd K.; Reamer, Robert A.; Volante, Ralph P.; and Shinkai, Ichiro, 4,920,218, Cl. 540-456.000.
Rebischung, Robert A., to Societe Alsacienne d'Aluminium. Method for manufacturing a lid for closing a container comprising a thermoplastic material sealing zone. 4,919,742, Cl. 156-269.000.
Recker, Hans-Gert: *See*—
Goetz, Norbert; Karbach, Stefan; and Recker, Hans-Gert, 4,920,232, Cl. 546-338.000.
Recticel: *See*—
Monstrey, Joost; and Wallaeys, Bart, 4,920,154, Cl. 521-131.000.
Redmond, John P.; Shaak, Ray N.; and Shirk, Albert. Process of making a layered elastomeric connector. 4,918,814, Cl. 29-878.000.
Redondo, Miguel A., to Mid-West Conveyor Company, Inc. Conveyor with twin bias accumulation. 4,919,053, Cl. 104-91.000.
Redwing, Joan M.: *See*—
Woodruff, David W.; and Redwing, Joan M., 4,920,012, Cl. 428-634.000.
Reed, Charles R. Rivet removal tool. 4,918,798, Cl. 29-243.540.
Reed, Mark S.: *See*—
Warrach, Wolfgang; and Reed, Mark S., 4,920,165, Cl. 524-91.000.
Reed, Michael A., to Environmental Products Corp. Sensing of material of construction and color of containers. 4,919,534, Cl. 356-73.000.
Reed Tool Company, Ltd.: *See*—
Fuller, John; and Regan, Michael C., 4,919,220, Cl. 175-329.000.
Rees Operations Pty. Ltd.: *See*—
Guimelli, Mark A., 4,919,467, Cl. 296-24.100.
Regan, Michael C.: *See*—
Fuller, John; and Regan, Michael C., 4,919,220, Cl. 175-329.000.
Regis, Richard R.: *See*—
Blem, Allen R.; Plant, Howard L.; and Regis, Richard R., 4,919,703, Cl. 71-86.000.
Regnier, Frederick E.; and Kopaciewicz, William, to Purdue Research Foundation. Reversed-phase packing material and method. 4,920,152, Cl. 521-31.000.
Rehberg, Heinrich; and Behringer, Hartmut, to Hoechst Aktiengesellschaft. Process for making azo pigments. 4,920,205, Cl. 534-582.000.
Rehberg, Heinrich: *See*—
Behringer, Hartmut; and Rehberg, Heinrich, 4,920,206, Cl. 534-582.000.
Reich, Gunter; and Worthington, William, to Leybold Aktiengesellschaft. Pumping system for a leak detecting device. 4,919,599, Cl. 417-423.400.
Reid, Scott: *See*—
Blum, Ronald D.; Reid, Scott; and Silverman, Howard P., 4,919,850, Cl. 264-1.400.
Reihl, Peter: *See*—
Stickel, Heinz; and Reihl, Peter, 4,918,954, Cl. 70-134.000.
Reinhardt, Josef; and Rouse, Martin. Esophagus probe. 4,919,147, Cl. 128-785.000.
Reliance Comm/Tec Corporation: *See*—
Szczebak, Ed, Jr., 4,920,496, Cl. 364-481.000.
Reliance Comm/Tex Corporation: *See*—
Suffi, Louis, 4,919,622, Cl. 439-395.000.
Remington, James: *See*—
Markov, Alexander; and Remington, James, 4,919,033, Cl. 84-726.000.
Remmers, John E.: *See*—
Kopala, John A.; and Remmers, John E., 4,919,128, Cl. 128-207.180.
Remus, Christian; and Chantelou, Olivier, to U.S. Philips Corporation. Digital video signal encoding arrangement, and corresponding decoding arrangement. 4,920,414, Cl. 358-133.000.
Rendina, Joseph R. Changeable message stretch band. 4,918,758, Cl. 2-171.000.
Renski, William J.: *See*—
Kiesewetter, Martin V.; and Renski, William J., 4,918,843, Cl. 37-142.00A.
Rensselaer Polytechnic Insitute: *See*—
Zelman, Allen, 4,920,105, Cl. 514-59.000.
Rensselaer Polytechnic Institute: *See*—
Isaacson, David, 4,920,490, Cl. 364-413.130.
Repik, Clyde P.: *See*—
Leatherman, Alfred F.; and Repik, Clyde P., 4,918,754, Cl. 2-16.000.
Repligen Corporation: *See*—
Pigiet, Vincent P., 4,919,924, Cl. 424-72.000.
Research Development Corporation of Japan: *See*—
Barsony, Istyan, 4,920,400, Cl. 357-58.000.
Research Triangle Institute: *See*—
Menon, Venugopal B., 4,920,083, Cl. 501-84.000.
Resonex, Inc.: *See*—
Hokbrook, James G.; and Jaks, Otto J., 4,920,315, Cl. 324-313.000.
Rex, Olle: *See*—
Lundstrom, Bjorn; and Rex, Olle, 4,918,889, Cl. 52-234.000.
Rexworks Inc.: *See*—
Alexander, Dennis W., 4,919,249, Cl. 193-6.000.
Reynolds, Desmond H. J., to Lucas Industries Public Limited Company. Pressure cylinder pipe coupling. 4,919,461, Cl. 285-174.000.
Reynolds Metals Company: *See*—
Davis, Dennis W.; Peterson, Ray D.; and Posey, Walter, Jr., 4,919,543, Cl. 374-139.000.
Stewart, Douglas V., 4,919,782, Cl. 204-243.00R.
Reynolds, Rodger L.: *See*—
Clarke, Donald A.; Reynolds, Rodger L.; and Pryor, Timothy R., 4,920,385, Cl. 356-237.000.
Rhee, Seong K.: *See*—
Das, Sajal; Prevorsek, Dusan C.; Rhee, Seong K.; and Bulger, William J., 4,920,159, Cl. 523-153.000.
Rheinische Braunkohlenwerke A.G.: *See*—
Lambertz, Johannes; Adlhoch, Wolfgang H.; Mittelstadt, Alfred G.; and Hermann, Wolfgang, 4,919,687, Cl. 48-62.00R.
Rheon Automatic Machinery Co., Ltd.: *See*—
Tashiro, Yasunori; and Suzuki, Yuji, 4,919,587, Cl. 414-795.800.
Rhinehart, Edward; Machek, James E.; and Sanctis, Michael W., to Medrad, Inc. Biopsy device. 4,919,146, Cl. 128-752.000.
Rhoades, Charles S.: *See*—
Chow, Yu C.; Liao, Kuan Y.; Chin, Maw-Rong; and Rhoades, Charles S., 4,920,403, Cl. 357-71.000.
Rhode Gear USA: *See*—
Newbold, Dixon, 4,918,949, Cl. 70-38.00A.
Rhodes, Michael L.; Kan, Ada; and Tivattanasuk, Eva, to MPDI, Inc. Method for generating perpendicular synthesized cross-sectional images. 4,920,573, Cl. 382-6.000.
Rhodes, Terrence E.: *See*—
Menardi, Elaine A.; Rhodes, Terrence E.; and Siemer, David R., 4,919,799, Cl. 209-538.000.
Rhone-Poulenc Chimie: *See*—
Bachot, Jean; and Le Roux, Olivier, 4,919,772, Cl. 204-96.000.
Rhone-Poulenc Inc.: *See*—
Gradeff, Peter S.; Schreiber, Fred G.; Grosbois, Jean; and Mauermann, Heiko, 4,920,204, Cl. 534-15.000.
Rice, Grant G.: *See*—
Wenshau, Hugo; and Rice, Grant G., 4,918,999, Cl. 73-863.540.
Rice, Michael R.: *See*—
Hird, John A.; Owen, Lindsey D.; and Rice, Michael R., 4,920,558, Cl. 379-67.000.
Hird, John A.; Owen, Lindsey D.; and Rice, Michael R., 4,920,562, Cl. 379-132.000.
Richard Wolf, GmbH: *See*—
Ams, Felix, 4,919,621, Cl. 439-191.000.
Richards, Roger C. Magnetically operated latch. 4,919,464, Cl. 292-251.500.
Richardson-Vicks Inc.: *See*—
Deckner, George E.; and Kulkarni, Rupali A., 4,919,934, Cl. 424-401.000.
Richmond, James W., to Stryker Corporation. Implant. 4,919,667, Cl. 623-18.000.
Rick, Jens O. Gas seal revolver. 4,918,850, Cl. 42-59.000.
Ricoh Company, Ltd.: *See*—
Mashiko, Harumitsu; Seto, Takashi; and Suzuki, Shigeru, 4,919,531, Cl. 355-27.000.
Obata, Takeo, 4,920,515, Cl. 365-189.080.
Okubo, Toshimitsu; Kobayashi, Kazuyoshi; Ohmura, Kohki; Sai, Yoshinobu; Satoh, Takuo; Yoshino, Yukihiko; Hoshi, Nobuyaki; Onodera, Takayuki; Endoh, Yasuo; Irokawa, Sigenobu; and Sannohe, Toshiaki, 4,919,045, Cl. 101-142.000.
Shinohara, Hiroichi, 4,919,524, Cl. 350-450.000.
Ridgway, David N.: *See*—
Miller, Calvin M.; Ridgway, David N.; and Sears, Frederick M., 4,919,509, Cl. 350-96.210.
Ries GmbH Bekleidungsverschlussfabrik: *See*—
Spindler, Siegfried W., 4,918,793, Cl. 24-392.000.
Rieter Scragg Limited: *See*—
Eaton, David C., 4,918,914, Cl. 57-264.000.
Riezler, Rudolf; and Wahhoud, Adnan, to Lindauer Dornier Gesellschaft mbH. Method and apparatus for plying a weft thread directly in an air nozzle loom. 4,919,172, Cl. 139-435.100.
Riga, Alan T.; and Forsberg, John W., to Lubrizol Corporation, The. Explosive emulsion. 4,919,178, Cl. 149-2.000.
Riggs, Douglas J.: *See*—
Mascitelli, Edmund J.; and Riggs, Douglas J., 4,919,558, Cl. 403-9.000.
Riley, M. Orville. Pack kitchen with airtight stove and flue oven. 4,919,109, Cl. 126-9.00R.
Riley, Robert E.; and McNeill, John, to Marine Terminals Corporation. Container ship worker safety system. 4,919,283, Cl. 212-160.000.
Riley, Ron J., to J. N. Fauver Comany, Inc. Conveyor control through binary coding. 4,919,057, Cl. 104-295.000.
Ringger, Hans R.: *See*—
Anthony, William M.; and Ringger, Hans R., 4,919,562, Cl. 403-16.000.
Rippel, Wally E., to California Institute of Technology. Integrated traction inverter and battery charger apparatus. 4,920,475, Cl. 363-132.000.
Riss, Gerhard, to Durkoppwerke GmbH. Button-hole sewing machine having a thread cutting and clamping device. 4,919,061, Cl. 112-70.000.
Ritter, Gerhard; Ritter, Klaus; and Stoisser, Gunther, to EVG Entwicklungs-u.Verwertungs-Gesellschaft m.b.H. Apparatus for heat treating a continuously moving metal wire. 4,919,395, Cl. 266-103.000.
Ritter, Klaus: *See*—
Ritter, Gerhard; Ritter, Klaus; and Stoisser, Gunther, 4,919,395, Cl. 266-103.000.
Ritter, Wolfgang; Handwerk, Hans-Peter; and Carduck, Franz-Josef, to Henkel Kommanditgesellschaft auf Aktien. Process for the formation of shaped agglomerates from particulate solids. 4,920,090, Cl. 501-439.000.
Ritvik Group Inc., The: *See*—
Bertrand, Vic, 4,919,635, Cl. 446-128.000.
Riva Calzoni S.p.A.: *See*—
Sala, Oneglio; and Montanari, Paolo, 4,919,571, Cl. 405-199.000.

Rivenburg, Dennis L., Sr.: *See*—
Elmgren, Peter J.; Emerick, Alan J.; Rivenburg, Dennis L., Sr.; Saraiya, Mukund K.; and Sissenstein, David W., Jr., 4,919,729, Cl. 148-24.000.

RJ Lee Group, Inc.: *See*—
Anderson, Kristy L.; and Bollinger, Edward R., 4,919,300, Cl. 220-408.000.

Roach, Kevin V.; Cetiner, M. Selim; Faherty, Vincent E.; and Ventura, Francis P., to T W Kutter Inc. Forming and filling flexible plastic packaging. 4,918,907, Cl. 53-453.000.

Robapharm AG: *See*—
Rosenberg nee Goldner, Thea, 4,919,931, Cl. 424-95.000.

Robbins, Clyde; and Marz, Daniel, to General Instrument Corporation. Dual loop sinewave descrambler and method of descrambling. 4,920,566, Cl. 380-19.000.

Robert Barr: *See*—
Barr, Robert; and Fletcher, Joel A., 4,920,333, Cl. 340-545.000.

Robert Bosch GmbH: *See*—
Barth, Walter; Braunbach, Karl-Heinz; and Stabler, Manfred, 4,918,868, Cl. 51-120.000.
Duelli, Heinz, 4,919,105, Cl. 123-590.000.
Kaes, Guenter, 4,919,497, Cl. 303-119.000.
Samuelson, Hakan; Thoms, Eric; Grauel, Ingolf; Stumpe, Werner; and Maurer, Franz, 4,919,492, Cl. 303-3.000.

Robert Linkletter Assoc.: *See*—
Agbay, Albert J., Sr., 4,919,286, Cl. 215-235.000.

Roberts, Dennis E., to Zebco, Corporation. Clutch mechanism for bait casting fishing reel. 4,919,360, Cl. 242-260.000.

Roberts, Eric J.: *See*—
Roof, William M.; Roberts, Eric J.; and Blair, Dennis P., 4,919,285, Cl. 215-230.000.

Roberts, Ian D.: *See*—
De Forest, Lockwood; Roberts, Ian D.; and Dixon, Christoper W. S., 4,918,938, Cl. 62-238.600.

Roberts, Raymond J., to Consarc Corporation. Method and apparatus for adjusting electrode isotherms within electro-slag remelting. 4,919,712, Cl. 75-10.240.

Robertson, David W.: *See*—
Gidda, Jaswant S.; Kirst, Herbert A.; and Robertson, David W., 4,920,102, Cl. 514-28.000.

Robey, Randy C. Trailer rear wheel slidable mounting assembly. 4,919,445, Cl. 280-149.200.

Robin Hood Multifoods Inc.: *See*—
Sadaranganey, Gobind T.; Zellen, Wendy; and Michaelides, John, 4,919,952, Cl. 426-254.000.

Robinson, Christopher P., to GEC-Marconi Limited. Imaging system having a swing-driven image sensor. 4,920,418, Cl. 358-213.280.

Robinson, Marguerite; and Holcomb, Manuel, to Gem, Inc. Method for removing and decomposing hydrocarbon compounds from water contaminated therewith. 4,919,819, Cl. 210-662.000.

Robinson, Mark E.: *See*—
Eggers, Derek C.; Holben, David V.; and Robinson, Mark E., 4,920,432, Cl. 360-33.100.

Robinson, Norman D., Jr.; and Farrell, Michael E., to Xerox Corporation. Apparatus for determining copy sheet set thickness. 4,919,410, Cl. 271-34.000.

Robusch, Gunter: *See*—
Meyer, Lutz; Hachtel, Ludwig; and Robusch, Gunter, 4,919,885, Cl. 420-104.000.

Robyn, Pierre; Mottet, Leon-Philippe; and Deschepper, Pierre, to Glaverbel. Forming refractory masses and composition of matter for use in forming such refractory masses. 4,920,084, Cl. 501-94.000.

Roche, David E.: *See*—
Gaudet, Peter W.; Olsen, Donald A.; Eacobacci, Michael J.; Harvell, John T.; Lepofsky, Robert J.; Roche, David E.; and Bender, Steven A., 4,918,930, Cl. 62-55.500.

Rockwell-CIM: *See*—
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Rockwell-Golde G.m.b.H.: *See*—
Schlapp, Albert; and Kunz, Norbert, 4,919,475, Cl. 296-213.000.

Rockwell International Corporation: *See*—
Mahoney, Murray W.; and Holmes, Leslie M., Jr., 4,919,323, Cl. 228-157.000.
Trachmzn, Edward G.; Shih, Shan; and Arzoian, John, 4,919,010, Cl. 475-281.000.
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Rodini, David J.: *See*—
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Rodman, Paul K.: *See*—
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Roehr Tool Corporation: *See*—
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Rohm and Haas Company: *See*—
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Rohrer, David W.: *See*—
Harvey, Billy R.; and Rohrer, David W., 4,918,794, Cl. 24-429.000.

Rollet, Robert, to Aerospatiale Societe Nationale Industrielle. Dynamic balancing system overcoming aerodynamic forces. 4,918,985, Cl. 73-471.000.

Rollins, Richard: *See*—
Hoekwater, Mark A.; Paren, Anthony R.; Kasting, Thomas; and Rollins, Richard, 4,919,389, Cl. 251-6.000.

Rolls-Royce plc: *See*—
Stratford, Brian S.; Hadaway, Edward S.; Chew, John; and Hartland, Howard G., 4,919,590, Cl. 415-116.000.

Romano, Timothy S.; and Gustafson, Kenneth L., to Santa Barbara Research Center. Metallurgically improved tip-off tube for a vacuum enclosure. 4,919,291, Cl. 220-2.200.

Roof, William M.; Roberts, Eric J.; and Blair, Dennis P., to Thoroughbred Plastics Corp. Tamper evident closure and method of manufacture of the same. 4,919,285, Cl. 215-230.000.

Rook, Peter M.: *See*—
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Roquette Feres: *See*—
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Rorer Pharamceutical Corp.: *See*—
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Rorer Pharmaceutical Corp.: *See*—
Huang, Fu-Chi; Galemmo, Robert A., Jr.; and Campbell, Henry F., 4,920,131, Cl. 514-311.000.
Huang, Fu-chi; Galemmo, Robert A., Jr.; and Campbell, Henry F., 4,920,132, Cl. 514-314.000.
Huang, Fu-chi; Galemmo, Robert A., Jr.; and Campbell, Henry F., 4,920,133, Cl. 514-314.000.
Pelletier, Jeffrey C.; Youssefyeh, Raymond D.; and Campbell, Henry F., 4,920,219, Cl. 540-523.000.
Pelletier, Jeffrey C.; Youssefyeh, Raymond D.; and Campbell, Henry F., 4,920,227, Cl. 546-133.000.

Rosa-Miranda, Roberto: *See*—
Brault, Alfred; and Rosa-Miranda, Roberto, 4,919,069, Cl. 118-308.000.

Roseberry, Patrick: *See*—
Glowski, Stanislas, and Roseberry, Patrick, 4,919,200, Cl. 165-166.000.

Rosenbaum, Robert S.; and Menta, Noshir R. Temporomandibular joint disc implant. 4,919,668, Cl. 623-18.000.

Rosenberg nee Goldner, Thea, to Robapharm AG. Method for producing osein hydroxyapatite compound. 4,919,931, Cl. 424-95.000.

Rosenberg, Peretz. Device and method for flushing fluid lines. 4,919,163, Cl. 137-15.000.

Rosentreter, Helga: *See*—
Wehling, Bernhard; Makowka, Bernd; Klein, Heinz-Gunter, deceased; Klein, Gertrud, heir; and Rosentreter, Helga, 4,919,680, Cl. 8-94.270.

Ross, Alan D.: *See*—
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Ross, Wayne A.: *See*—
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Rossi, Adelio: *See*—
Salabe, Mario; and Rossi, Adelio, 4,919,437, Cl. 273-410.000.

Rossi, Anthony R.: *See*—
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Rossle, Martin: *See*—
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Rothwell, Harold L., Jr.; and English, George J., to GTE Products Corporation. Arc discharge headlamp system. 4,920,459, Cl. 362-61.000.

Rousseau, Alain: *See*—
Martinoli, Jean-Luc; Rousseau, Alain; and Vilain, Pascal, 4,918,984, Cl. 73-64.100.

Roussel Uclaf: *See*—
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Rowe, Paul: *See*—
Proulx, Stephen; and Rowe, Paul, 4,919,182, Cl. 152-221.000.

Rowland, Roy C.: *See*—
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Royal Appliance Mfg. Co.: *See*—
Sovis, John F.; Smith, Robert M.; and Bramball, George H., 4,918,781, Cl. 15-392.000.

Ruane, Robert E., to International Business Machines Corporation. Processing of cores for circuit boards or cards. 4,918,812, Cl. 29-846.000.

Rudberg, Marianne: *See*—
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Ruddock, John C.: *See*—
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Rudin, Alfred: *See*—
Chip, Gerald K.; and Rudin, Alfred, 4,920,160, Cl. 523-201.000.

Ruetman, Sven H.; Anand, Joginder N.; and Collins, G. Robert, to Dow Chemical Company, The. Antistatic polyurethane-urea dispersions. 4,920,167, Cl. 524-155.000.

Ruggieri, Daniela: *See*—
Chiodini, Laura; Gobbini, Mauro; Mantegani, Sergio; Ruggieri, Daniela; Temperilli, Aldemio; Traquandi, Gabriella; and Ferrari, Patrizia, 4,920,099, Cl. 514-26.000.

Ruhl, Dieter: *See*—
Clark, Peter D.; Gilbert, John A.; Ott, Gunther; Ruhl, Dieter; and Santure, David J., 4,920,162, Cl. 523-400.000.

Ruijs, Jan B. F. W., to AT&T Philips Telecommunications. Voltage controlled r-c oscillator and phase locked loop. 4,920,322, Cl. 331-17.000.

Ruiz, Peter L. Vehicular mounted excavator. 4,919,585, Cl. 414-718.000.

Ruotta, Reijo; Rajala, Raimo; Jokioinen, Ilkka; and Ahlskog, Sture, to Valmet Paper Machinery Inc. Method and apparatus for drying a moving web. 4,918,828, Cl. 34-4.000.

Rupp, Hartwig; and Stenzel, Otto, to Leybold Heraeus GmbH. Method for making additions to molten alloys and bodies molded from alloying metals. 4,919,187, Cl. 164-57.100.

Rutledge, Russell P.: *See*—
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Rutledge, Woodrow T., Jr.; Rutledge, Russell P.; Jones, T. Mike; McCown, Don E.; and Hodnett, J. Tom, to Fiberglass Technologies, Inc. Oil well sucker rod. 4,919,560, Cl. 403-268.000.

Rydell, Mark A.; and Shockey, Rick L., to Schneider (USA) Inc., A Pfizer Company. Inflation device for angioplasty catheter. 4,919,121, Cl. 604-97.000.

Rydstrom, Sven-Olof; and Johansson, Mikael, to Saab-Scania AB. Arrangement for riveting. 4,919,321, Cl. 227-69.000.

Ryobi Ltd.: *See*—
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Saab-Scania AB: *See*—
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Samuelson, Hakan; Thoms, Eric; Grauel, Ingolf; Stumpe, Werner; and Maurer, Franz, 4,919,492, Cl. 303-3.000.

Sacks, Jack; and Weisner, Ralph, to View Engineering, Inc. Z-axis measurement system. 4,920,273, Cl. 250-560.000.

Sadaoka, Yoshihiko: *See*—
Sakai, Yoshiro; Sadaoka, Yoshihiko; Kuroiwa, Takaai; Abe, Tooru; and Miyagishi, Tetsuya, 4,920,451, Cl. 361-286.000.

Sadaranganey, Gobind T.; Zelles, Wendy; and Michaelides, John, to Robin Hood Multifoods Inc. Process for the production of light colored food grade protein and dietary fibre from grainby-products. 4,919,952, Cl. 426-254.000.

Saeki, Yukio: *See*—
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Tokunaga, Yukio; and Saeki, Yukio, 4,920,186, Cl. 525-506.000.

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Sai, Yoshinobu: *See*—
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Sailer, Erwin: *See*—
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Saishoji, Toshihide: *See*—
Ito, Atsushi; Kumazawa, Satoru; Sato, Nobuo; and Saishoji, Toshihide, 4,920,138, Cl. 514-383.000.

Saito, Hiroyuki: *See*—
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Saito, Noboru: *See*—
Takeuchi, Hirosato; Tanaka, Yutaka; Miyazaki, Osahiko; Saito, Noboru; Kubo, Haruo; Kotake, Naoyuki; and Nagumo, Makoto, 4,918,969, Cl. 72-334.000.

Saito, Tasuku, to Bridgestone Corporation. Golf ball. 4,919,434, Cl. 273-235.00R.

Saito, Yasuhide, to Canon Kabushiki Kaisha. Recording apparatus with carriage-driving/sheet-feeding mechanism. 4,920,258, Cl. 346-134.000.

Saito, Yasuhiko, to Sony Creative Products Incorporation. Timepiece assembly including sheet with wristwatch removable therefrom. 4,920,526, Cl. 368-281.000.

Saito, Yasujiro, to Jidosha Denki Kogyo Kabushiki Kaisha. Bearing holder with resilient retaining pawls. 4,920,289, Cl. 310-90.000.

Saiylov, Nurmamed; and Nazarov, Shaakhmed A. Solar radiation concentrator. 4,919,527, Cl. 350-613.000.

Sakai, Jun: *See*—
Sangyoji, Kazuo; Yamamoto, Takemi; Okamoto, Tsugio; Hatta, Naoyuki; Asano, Yuji; Sakakibara, Kenji; Nakai, Hitoshi; Akao, Michitoshi; Sakai, Jun; and Matsumoto, Yumio, 4,920,374, Cl. 355-27.000.
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Sakai, Tetsushi; Kobayasi, Yoshizi; Yamauchi, Hironori; and Arita, Yoshinobu, to Nippon Telegraph & Telephone Public Corp. Bipolar transistors. 4,920,401, Cl. 357-59.000.

Sakai, Yoshiro; Sadaoka, Yoshihiko; Kuroiwa, Takaai; Abe, Tooru; and Miyagishi, Tetsuya, to Yamatake-Honeywell Co., Ltd. Moisture-sensitive element. 4,920,451, Cl. 361-286.000.

Sakakibara, Kenji: *See*—
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Sakakibara, Shiro; Miyaishi, Yoshinori; and Kano, Yoshiaki, to Aisin-Aw Kabushiki Kaisha. Endless transmission belt. 4,919,645, Cl. 474-245.000.

Sakakibara, Teigo; Sakai, Kiyoshi; Sakoh, Harumi; and Amamiya, Shoji, to Canon Kabushiki Kaisha. Electrophotographic photosensitive member comprising aryl amine charge transport material. 4,920,022, Cl. 430-59.000.

Sakakihara, Hisashi: *See*—
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Sakamoto, Noriaki, to Kabushiki Kaisha Toshiba. Refrigerating cycle utilizing cold accumulation material. 4,918,936, Cl. 62-117.000.

Sakamoto, Noriaki; Nishioka, Yoshiki; Yamanaka, Toshihiro; Horie, Nobuyuki; Kobayashi, Shozou; Deguchi, Toshihisa; and Maeda, Shigemi, to Sharp Kabushiki Kaisha. Method of disk recording using alternative recording tracks. 4,920,528, Cl. 369-54.000.

Sakamoto, Takashi: *See*—
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Sakamoto, Yutaka; and Kamaga, Ryuichi, to Kabushiki Kaisha Toshiba. Method of cleaning scope end of endoscope and endoscope with scope end cleaning mechanism. 4,919,113, Cl. 128-4.000.

Sakashita, Shigeo, to Casio Computer Co., Ltd. Electronic instrument with a pitch data delay function. 4,919,032, Cl. 84-653.000.

Sakashita, Takeshi; Honda, Narimichi; and Arata, Masami, to Mitsui Petrochemical Industries, Ltd. Curable compositions. 4,920,188, Cl. 526-196.000.

Sakata, Shinji: *See*—
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Sakayori, Hiroyuki: *See*—
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Sakoh, Harumi: *See*—
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Sakurai, Tadashi: *See*—
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Sala, Oneglio; and Montanari, Paolo, to Riva Calzoni S.p.A. Orientatable blocking unit with cardan joint for supporting structures on cylindrical elements. 4,919,571, Cl. 405-199.000.

Salabe, Mario; and Rossi, Adelio, to Impresa Costruzioni Soc. Fra.Sa. a r.l. Self-regeneration ballistic projectile-arrester. 4,919,437, Cl. 273-410.000.

Salkeld, William J., to Linero Pty. Ltd. Green asparagus harvester. 4,918,909, Cl. 56-327.200.

Salomon S.A.: *See*—
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Salsgiver, James A.; Knipe, Randal K.; and Stroble, Carl P., to Allegheny Ludlum Corporation. Method for refining magnetic domains of electrical steels to reduce core loss. 4,919,733, Cl. 148-113.000.

Salton, Robert B.: *See*—
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Sammells, Anthony F., to Gas Research Institute. Electrochemical H_2S conversion. 4,920,015, Cl. 429-17.000.

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Sample, Jay W. Subsurface dune restoration system and method. 4,919,567, Cl. 405-19.000.

Sampson, Craig F., to Bell & Howell Publication Systems Company. Tilt and swivel support apparatus. 4,919,387, Cl. 248-921.000.

Samson, G. Leo, to Harricana Metal, Inc. Tree delimbing apparatus. 4,919,175, Cl. 144-2.00Z.

Samsung Electronic Co. Ltd.: *See*—
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Samsung Electronics Co., Ltd.: *See*—
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Samsung Semiconductor and Telecommunications Co., Ltd.: *See*—
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Samuelson, Hakan; Thoms, Eric; Grauel, Ingolf; Stumpe, Werner; and Maurer, Franz, to SAAB-Scania AB; and Robert Bosch GmbH. Multiple-circuit brake system. 4,919,492, Cl. 303-3.000.

Samyn, Russell H., to Illinois Tool Works Inc. Tool holder retention system. 4,919,574, Cl. 409-219.000.

Sanchez, George: *See*—
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Sanctis, Michael W.: *See*—
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Sandoz Ltd.: *See*—
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Sandy Alexander, Inc.: *See*—
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Sandy, Neil A.: *See*—
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Sangyoji, Kazuo; Yamamoto, Takemi; Okamoto, Tsugio; Hatta, Naoyuki; Asano, Yuji; Sakakibara, Kenji; Nakai, Hitoshi; Akao, Michitoshi; Sakai, Jun; and Matsumoto, Yumio, to Brother Kogyo Kabushiki Kaisha. Picture recording apparatus. 4,920,374, Cl. 355-27.000.
Sankey, George H.; and Homer, Nigel J., to Tate & Lyle Public Ltd. Co. Selected removal of trityl groups from trispa. 4,920,207, Cl. 536-124.000.
Sannohe, Toshiaki: *See*—
Okubo, Toshimitsu; Kobayashi, Kazuyoshi; Ohmura, Kohki; Sai, Yoshinobu; Satoh, Takuo; Yoshino, Yukihiko; Hoshi, Nobuyuki; Onodera, Takayuki; Endoh, Yasuo; Irokawa, Sigenobu; and Sannohe, Toshiaki, 4,919,045, Cl. 101-142.000.
Sano, Kenji; Maruyama, Takesuke; Satoh, Hironobu; Deguchi, Masaharu; and Murakami, Toshio, to Hitachi, Ltd. Automatic focusing system. 4,920,420, Cl. 358-227.000.
Sano, Masafumi: *See*—
Takasu, Katsuji; Sano, Masafumi; Tsuda, Hisanori; and Hirai, Yutaka, 4,920,387, Cl. 357-17.000.
Sano, Shojiro: *See*—
Iwakura, Ken; Sano, Shojiro; Satomura, Masato; Ito, Koreshige; and Matsuoka, Katsumi, 4,920,091, Cl. 503-211.000.
Sanofi: *See*—
Casellas, Pierre; Gros, Pierre; and Jansen, Franz, 4,919,927, Cl. 424-85.910.
Jansen, Franz; and Gros, Pierre, 4,919,928, Cl. 424-85.910.
Sanovo Engineering A/S: *See*—
Rasmussen, Hans Kristian L., 4,919,042, Cl. 99-499.000.
Sanshin Dengu Manufacturing Co., Ltd.: *See*—
Narita, Yuichi, 4,920,468, Cl. 362-287.000.
Sanshin Kogyo Kabushiki Kaisha: *See*—
Isogawa, Atsushi; and Sumigawa, Yukio, 4,919,629, Cl. 440-62.000.
Sansho Seiyaku Co., Ltd.: *See*—
Hatae, Shinkichi, 4,919,921, Cl. 424-62.000.
Santa Barbara Medical Foundation Clinic: *See*—
Doane, Wilton A., 4,919,651, Cl. 604-96.000.
Santa Barbara Research Center: *See*—
Romano, Timothy S.; and Gustafson, Kenneth L., 4,919,291, Cl. 220-2.200.
Santalone, John J., Jr.: *See*—
Litz, Lawrence M.; and Santalone, John J., Jr., 4,919,849, Cl. 261-36.100.
Santiago, Julio A. Gunsight. 4,918,823, Cl. 33-241.000.
Santiago, Pete: *See*—
Larsen, Kurt K.; and Santiago, Pete, 4,919,233, Cl. 187-9.00R.
Santini, Franco, to Iveco Fiat S.p.A. Leaf spring attachment. 4,919,404, Cl. 267-260.000.
Santure, David J.: *See*—
Clark, Peter D.; Gilbert, John A.; Ott, Gunther; Ruhl, Dieter; and Santure, David J., 4,920,162, Cl. 523-400.000.
Sanyo Electric Co., Ltd.: *See*—
Hinotani, Katsuhiro; Kishimoto, Shunichi; Kosaka, Haruhisa; Terada, Katsumi; and Hamagishi, Goro, 4,920,298, Cl. 313-493.000.
Horikoshi, Tadao; Nagasuma, Hisao; Sugimoto, Minoru; and Numao, Masanobu, 4,919,120, Cl. 126-93.000.
Kurihara, Toshiyuki; Aomoto, Benso; and Nishio, Ko, 4,919,074, Cl. 118-697.000.
Watanabe, Ryuji; Kosano, Motohiko; and Kawakami, Hirokazu, 4,918,806, Cl. 148-16.500.
Saraiya, Mukund K.: *See*—
Elmgren, Peter J.; Emerick, Alan J.; Rivenburg, Dennis L., Sr.; Saraiya, Mukund K.; and Sissenstein, David W., Jr., 4,919,729, Cl. 148-24.000.
Sargent, Ronald J., to Alopex Industries, Inc. Floating fountain device. 4,920,465, Cl. 362-96.000.
Sarkisian, Paul H.; and Becker, Frederick E., to Gas Research Institute. Ceramic tile burner. 4,919,609, Cl. 431-7.000.
Sartori, Guido: *See*—
Shulik, Larry J.; Sartori, Guido; Ho, W. S. Winston; Thaler, Warren; and Milliman, George E., 4,919,904, Cl. 423-225.000.
Sasaki, Nobuyoshi. Mold core for investment casting, process for preparing the same and process for preparing mold for investment casting having therewithin said mold core. 4,919,193, Cl. 164-516.000.
Sasaki, Ryoichi; Nakamura, Tsutomu; Suzuki, Michio; Shinnai, Kohsuke; Ido, Nobuhiko; and Tsunoda, Tomoaki, to Hitachi, Ltd.; and Hitachi Micro Computer Engineering Ltd. Network control method and apparatus therefor. 4,920,529, Cl. 370-16.000.
Sasaki, Shigeru; and Sakakihara, Hisashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Film feeder of a cassetteless X-ray photographic apparatus. 4,920,553, Cl. 378-173.000.
Sasaki, Yasuoki: *See*—
Sato, Takesi; Mitsuhashi, Kepichi; Tomita, Yoji; and Sasaki, Yasuoki, 4,918,872, Cl. 51-209.00R.
Sasaki, Yukio; Watanabe, Takayuki; Takamiya, Hiroshi; Watanabe, Kazuo; and Yamazaki, Yoko, to Mitsubishi Gas Chemical Company, Inc. Epoxy resin composition. 4,920,164, Cl. 523-466.000.
Sasaoka, Senzo; and Inoue, Nobuaki, to Fuji Photo Film Co., Ltd. Silver halide photographic material and image forming method using the same. 4,920,034, Cl. 430-264.000.
Sasaoka, Senzo: *See*—
Inoue, Nobuaki; Sasaoka, Senzo; Inagaki, Yoshio; Kojima, Tetsuro; and Yagihara, Morio, 4,920,029, Cl. 430-264.000.
Sasayama, Atsushi: *See*—
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Sato, Hiroshi: *See*—
Watanabe, Yosuke; Kawakami, Yuji; Kikuchi, Koichiro; Ogawa, Yoshiyuki; and Sato, Hiroshi, 4,919,926, Cl. 424-81.000.
Sato, Keiji; and Nakatsukasa, Yasutaka, to Ryobi Ltd. Method of forming as-cast holes by using cores, and apparatus for practicing the method. 4,919,189, Cl. 164-137.000.
Sato, Koji, to Daiwa Golf Co., Ltd. Grip of a golf club and a manufacturing method thereof. 4,919,420, Cl. 273-81.00B.
Sato, Masahiro: *See*—
Yoshida, Makoto; Sato, Masahiro; Koga, Kazunori; Osamura, Kazumi; Kousaka, Shoji; Maeda, Tatsumi; Yokoyama, Kiyoshi; and Matsunaka, Masafumi, 4,920,085, Cl. 501-97.000.
Sato, Masashiko: *See*—
Yamazaki, Shumpei; Sato, Masashiko; and Sakayori, Hiroyuki, 4,919,633, Cl. 445-24.000.
Sato, Nobuo: *See*—
Ito, Atsushi; Kumazawa, Satoru; Sato, Nobuo; and Saishoji, Toshihide, 4,920,138, Cl. 514-383.000.
Sato, Takesi; Mitsuhashi, Kepichi; Tomita, Yoji; and Sasaki, Yasuoki, to Kanebo Limited. Surface grinding apparatus. 4,918,872, Cl. 51-209.00R.
Satoh, Hironobu: *See*—
Sano, Kenji; Maruyama, Takesuke; Satoh, Hironobu; Deguchi, Masaharu; and Murakami, Toshio, 4,920,420, Cl. 358-227.000.
Satoh, Hiroshi: *See*—
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Satoh, Kozo, to Kabushiki Kaisha Toshiba. Magnetic resonance imaging system. 4,920,314, Cl. 324-312.000.
Satoh, Takuo: *See*—
Okubo, Toshimitsu; Kobayashi, Kazuyoshi; Ohmura, Kohki; Sai, Yoshinobu; Satoh, Takuo; Yoshino, Yukihiko; Hoshi, Nobuyuki; Onodera, Takayuki; Endoh, Yasuo; Irokawa, Sigenobu; and Sannohe, Toshiaki, 4,919,045, Cl. 101-142.000.
Satoh, Toshihiro: *See*—
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Satomura, Masato: *See*—
Iwakura, Ken; Sano, Shojiro; Satomura, Masato; Ito, Koreshige; and Matsuoka, Katsumi, 4,920,091, Cl. 503-211.000.
Saturn Machine & Welding Co., Inc.: *See*—
Baird, William R.; and Baird, Billy C., 4,919,764, Cl. 202-248.000.
Savage, Russell C.; Zeller, Gary P.; and Skirha, Martin D., to General Motors Corporation. Method for making composite tread for track-laying vehicles. 4,919,876, Cl. 264-258.000.
Sawada, Hachiro; Fujitsu, Tadashi; Takahashi, Ken-ichi; and Honma, Hideaki, to NEC Corporation. Display managing arrangement with a display memory divided into a matrix of memory blocks, each serving as a unit for display management. 4,920,504, Cl. 364-521.000.
Sawaki, Yukichi: *See*—
Akao, Michitoshi; Sakakibara, Kenji; Katoh, Tokunori; Sawaki, Yukichi; Sonoda, Takakuni; and Suzuki, Makoto, 4,920,375, Cl. 355-27.000.
Sawamura, Mitsuharu; Hongu, Kazuoki; and Kikuchi, Kazuhiko, to Canon Kabushiki Kaisha. Magneto-optical recording medium with 9:1–1:9 aluminum or silicon oxide and aluminum or silicon nitride mixture. 4,920,007, Cl. 428-457.000.
Sawase, Terumi: *See*—
Nakamura, Hideo; and Sawase, Terumi, 4,920,518, Cl. 365-228.000.
Sawdai, Albert H., to Procter & Gamble Company, The. Method of and apparatus for compensatingly adjusting doctor blade. 4,919,756, Cl. 162-111.000.
Sawyer, Willard H.: *See*—
Hamner, Glen P., deceased; Sawyer, Willard H.; and Boucher, Heather A., 4,919,786, Cl. 208-27.000.
Scarlett, John: *See*—
Wilkes, Peter R.; Scarlett, John; and Harrison, George E., 4,919,765, Cl. 203-64.000.
Schaefer, Edward J., to Franklin Electric Co., Inc. Method and apparatus for making permanent magnet rotors. 4,918,802, Cl. 29-598.000.
Schaefer, Louis E., Jr. Subsea wellhead protection system. 4,919,210, Cl. 166-356.000.
Schafer, Horst; Kossmehl, Gerhard; and Neumann, Walter, to Ciba-Geigy Corporation. Hydrophilic silicone rubber article and process for its preparation. 4,920,184, Cl. 525-477.000.
Schaldach, Max, to Biotronik, Mess- und Therapiegerate GmbH & Co. Ingenieurburo Berlin. Cardiac pacemaker with physiological control. 4,919,137, Cl. 128-419.0PG.
Scheiderer, Gerrit: *See*—
Bender, Richard; and Scheiderer, Gerrit, 4,919,897, Cl. 422-165.000.
Schelhas, Klaus-Dieter, to Orthoplant Endoprothetick GmbH. Hip cup for a hip joint acetabular prosthesis. 4,919,674, Cl. 623-22.000.
Schering A.G.: *See*—
Morgan, Thomas K., Jr.; and Nickisch, Klaus, 4,920,116, Cl. 514-210.000.
Schiel, Christian; Flamig, Hans; and Schutte, Andreas, to J. M. Voith GmbH. Long nip press roll with internal line couplings at both axial roll ends. 4,919,761, Cl. 162-358.000.

Schindler, Erich; and Maier, Franz, to Akzo NV. Manufacture of porous carbon membranes. 4,919,860, Cl. 264-29.100.

Schlapp, Albert; and Kunz, Norbert, to Rockwell-Golde G.m.b.H. Sliding roof or sliding lifting roof for motor vehicles. 4,919,475, Cl. 296-213.000.

Schleicher, Bernd, to Webasto AG Fahrzeugtechnik. Device for actuating an incompressible drive cable. 4,919,005, Cl. 74-501.600.

Schleimann, Harald: *See*—
Wissmann, Michael; Schleimann, Harald; and Weber, Jurgen, 4,919,091, Cl. 123-179.0BG.

Schloemann, Ernst F. R. A.; Blight, Ronald E.; and Mozzi, Robert L., to Raytheon Company. Miniature circulators for monolithic microwave integrated circuits. 4,920,323, Cl. 333-1.100.

Schmid, Daniel: *See*—
Benoit, Fredrick C.; Cardenas, Ruben; Schmid, Daniel; and Wisniewski, Joseph M., 4,918,886, Cl. 52-221.000.

Schmid, Heinz: *See*—
Fink, Hans-Werner; Morin, Roger; Schmid, Heinz; and Stocker, Werner, 4,919,780, Cl. 204-192.340.

Schmider, Fritz: *See*—
Albrecht, Klaus; Hans, Helmut; von der Heide, Johann; and Schmider, Fritz, 4,920,292, Cl. 310-114.000.

Schmidlkofer, Jakob: *See*—
Innertsberger, Ernst; Schmidlkofer, Jakob; Huber, Peter; Burger, Willibald; and Schulze, Joachim, 4,919,843, Cl. 252-358.000.

Schmidt, Adolf; Hendricks, Udo; Bomer, Bruno; Ott, Karl-Heinz; Eichenauer, Herbert; and Pischtschan, Alfred, to Bayer Aktiengesellschaft. Polymeric emulsifiers based on amino telechelatic vinyl oligomers II. 4,920,181, Cl. 525-327.500.

Schmidt, Friedrich H.: *See*—
Mayer, Georg; Schmidt, Friedrich H.; and Schmidt, Friedrich H., 4,918,934, Cl. 62-89.000.
Mayer, Georg; Schmidt, Friedrich H.; and Schmidt, Friedrich H., 4,918,934, Cl. 62-89.000.

Schmidt, Rudolf, to C. CHRIST Abgasfreie Werkzeugreinigungsapparate fur die Kunststoffindustrie. Apparatus for removing residues from parts of plastics processing machines. 4,919,161, Cl. 134-108.000.

Schmitt, Michael: *See*—
Elmer, Werner; and Schmitt, Michael, 4,920,283, Cl. 307-443.000.

Schnegelberger, Harald: *See*—
Lehmann, Rudolf; Hachmann, Klaus; Biermann, Manfred; and Schnegelberger, Harald, 4,920,100, Cl. 514-23.000.

Schneider, Chris K. Method and apparatus for manipulating tubing in a well. 4,919,208, Cl. 166-286.000.

Schneider, Franz K., Jr.; and Haubert, Michael V., to Albion Engineering Company. Dual component pneumatically operated caulking gun. 4,919,307, Cl. 222-137.000.

Schneider (USA) Inc., A Pfizer Company: *See*—
Rydell, Mark A.; and Shockey, Rick L., 4,919,121, Cl. 604-97.000.

Schnettler, Richard A.: *See*—
Jones, Winton D.; Dage, Richard C.; and Schnettler, Richard A., 4,920,229, Cl. 546-283.000.

Schoch, Daniel A., to Minster Machine Company, The. Monitorable and compensatable feedback tool and control system for a press using a solid tool backup element. 4,918,956, Cl. 72-21.000.

Schoendorfer, Donald W.; and Williamson, Lee H., to Baxter International Inc. Blood cell washing systems and methods. 4,919,817, Cl. 210-639.000.

Schon, Norbert: *See*—
Buysch, Hans-Josef; Schon, Norbert; Kress, Hans-Jurgen; Eichenauer, Herbert; and Buekers, Josef, 4,920,166, Cl. 524-141.000.

Schott Fiber Optics: *See*—
Siegmund, Walter P., 4,919,112, Cl. 128-4.000.

Schreiber Foods, Inc.: *See*—
Yee, Jeng-Jung; and Narasimhan, Rajagopalan, 4,919,943, Cl. 426-39.000.

Schreiber, Fred G.: *See*—
Gradeff, Peter S.; Schreiber, Fred G.; Grosbois, Jean; and Mauermann, Heiko, 4,920,204, Cl. 534-15.000.

Schreiner, Paul: *See*—
Jaffe, Robert S.; Lavin, Mark A.; Rand, Rick A.; and Schreiner, Paul, 4,920,429, Cl. 358-471.000.

Schrinner, Elmar: *See*—
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Schroder, Ludwig: *See*—
Curtze, Jurgen; Schroder, Ludwig; and Briner, Paul H., 4,920,222, Cl. 544-158.000.

Schroeder, Otto E.: *See*—
Barry, David L.; Dreher, Mark L.; Johnson, Alan A.; and Schroeder, Otto E., 4,919,947, Cl. 426-94.000.

Schubert, Hans H., to Hoechst Aktiengesellschaft. Process for the preparation of (aryl)-(dimethyl)-(3-(4-fluoro-3-aryloxyphenyl)-propyl)silanes. 4,920,212, Cl. 549-214.000.

Schuler, Klaus: *See*—
Beier, Helmut; Bohrdt, Joaquin-Conrado; and Schuler, Klaus, 4,920,242, Cl. 200-148.00B.

Schulten, Gerd-Hermann: *See*—
Burow, Wilfried; Schulten, Gerd-Hermann; and Kiemle, Peter, 4,919,727, Cl. 106-456.000.

Schulz, Guenther; Druschke, Wolfgang; and Jaeger, Helmut, to BASF Aktiengesellschaft. Radiation-curable contact adhesives based on polyurethane acrylates. 4,920,157, Cl. 522-96.000.

Schulze, Joachim: *See*—
Innertsberger, Ernst; Schmidlkofer, Jakob; Huber, Peter; Burger, Willibald; and Schulze, Joachim, 4,919,843, Cl. 252-358.000.

Schutes, Delvin D. Method for conditioning golf club grip. 4,919,861, Cl. 264-36.000.

Schutte, Andreas: *See*—
Schiel, Christian; Flamig, Hans; and Schutte, Andreas, 4,919,761, Cl. 162-358.000.

Schwartz, Kenneth E., to Honeywell Inc. Capacitive keyswitch membrane with self contained sense-to-ground capacitance. 4,920,343, Cl. 341-33.000.

Schwartzman, Everett H. Dynamically self-adjusted fluid bearing. 4,919,547, Cl. 384-110.000.

Schwarz, Douglas B.: *See*—
Pyzik, Aleksander J.; Schwarz, Douglas B.; Dubensky, William J.; and Beaman, Donald R., 4,919,689, Cl. 51-309.000.

Schwarz, Kurt K.; and Smith, Thomas D., to Laurence, Scott & Electromotors Ltd. Insulation system method for multiturn coils of high voltage electrical rotating machines. 4,918,801, Cl. 29-596.000.

Schwarzer, Paul: *See*—
Kircher, Dieter; and Schwarzer, Paul, 4,919,495, Cl. 303-113.000.

Schweikert, Wilhelm; Will, Norbert; and Lauer, Wilhelm, to Siemens Aktiengesellschaft. Aluminum electrolyte capacitor and method for the manufacture thereof. 4,920,457, Cl. 361-530.000.

Schweizerische Eidgenossenschaft Vertreten Durch: Eidg. Munitionsfabrik Thun Der Gruppe Fur Rustendienste: *See*—
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Schwirtlich, Ingo: *See*—
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Scientific Glass (Drainline) Limited: *See*—
Buckley, Christopher M., 4,918,940, Cl. 62-285.000.

Scorsiroli, Marcello, to Champion Spark Plug Italiana S.P.A. Wiper arm assembly for motor vehicles. 4,918,780, Cl. 15-250.210.

Scott, Mark A., to Thorn EMI plc. Power supply. 4,920,300, Cl. 315-209.00R.

Scott, Pierre: *See*—
Dufresne, Michel; Sammoun, Samir; Gregory, Dave; Champagne, Jean-Paul; Tessier, Alain; Scott, Pierre; and Methot, Francois, 4,920,533, Cl. 370-85.200.

Scott, Terence A., to Leggett & Platt, Incorporated. Posturized spring bedding product. 4,918,773, Cl. 5-252.000.

Scully Signal Company: *See*—
Mitchell, Andrew C., 4,920,561, Cl. 379-106.000.

Searle, William M.; and Spector, George. Garden roller tool with adjustable telescopic arms. 4,919,213, Cl. 172-350.000.

Sears, Frederick M.: *See*—
Miller, Calvin M.; Ridgway, David N.; and Sears, Frederick M., 4,919,509, Cl. 350-96.210.

Sears, Stephan B.; and Pomeroy, Dan M., to Superstill Technology, Inc. Radially compact fluid compressor. 4,919,592, Cl. 415-207.000.

Segall, Jeane; and Shorr, Leonard M., to Bromine Compounds Limited. Method for stabilizing isothiazolinoses. 4,920,137, Cl. 514-372.000.

Seibert, Gerhard: *See*—
Limbert, Michael; Schrinner, Elmar; and Seibert, Gerhard, 4,919,932, Cl. 424-114.000.

Seidensticker, Raymond G.; Kochka, Edgar L.; and Duncan, Charles S., to Westinghouse Electric Corp. Barrier design for crucibles for silicon dendritic web growth. 4,919,901, Cl. 422-249.000.

Seiko Epson Corporation: *See*—
Newton, Thomas H.; and Shimoda, Tatsuya, 4,919,858, Cl. 264-24.000.

Seiko Epson Corporation, a Japanese Corporation: *See*—
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Seikosha Co., Ltd.: *See*—
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Nakagawa, Tadashi; Shinozaki, Nobuo; Koizumi, Hiroyuki; Yamazaki, Hiroshi; Saito, Hiroyuki; Matsushita, Katsuhiko; and Tanikawa, Miyoshi, 4,920,372, Cl. 354-412.000.

Seino, Hitoshi; Kondo, Kensuke; and Takamiya, Takeomi, to Kinugawa Rubber Industrial Co., Ltd. Weatherstrip for sashless door in automotive vehicles. 4,919,471, Cl. 296-154.000.

Seito, Shinichi: *See*—
Ogura, Makoto; Kawai, Tatsundo; Yamada, Katsuhiko; and Seito, Shinichi, 4,920,431, Cl. 358-496.000.

Sekerheid En Elektronika Laboratoria: *See*—
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Seki, Masao; and Higashino, Hiroki, to Mitsui Petrochemical Industries, Ltd.; and Ciluck Co., Ltd. Condensate drainage apparatus. 4,919,710, Cl. 55-417.000.

Seki, Reiji: *See*—
Taniguchi, Nobuyuki; Ishimura, Toshihiko; Ishikawa, Norio; Seki, Reiji; and Akada, Yasuaki, 4,920,370, Cl. 354-402.000.

Sekiguchi, Atsushi: *See*—
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Sekimoto, Kunio; and Morimoto, Takeshi. to Matsushita Electric Industrial Co., Ltd. Video signal recording and reproducing apparatus. 4,920,425, Cl. 358-334.000.

Sekiya, Teruo: *See*—
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Sekozawa, Teruji: *See*—
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Shimada, Kousaku; Sekozawa, Teruji; and Funabashi, Motohisa, 4,919,098, Cl. 123-422.000.
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Selzer, Robert J.; and Leitzman, Noel E., to Navistar International Transportation Corp. Suspension brake torque reaction leaf. 4,919,399, Cl. 267-31.000.
Semiconductor Energy Laboratory Co., Ltd.: *See*—
Yamazaki, Shumpei; Sato, Masashiko; and Sakayori, Hiroyuki, 4,919,633, Cl. 445-24.000.
Semlitsch, Manfred: *See*—
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Senderowicz, Daniel; Torelli, Guido; and Nicollini, Germano, to SGS Microelectronica SpA. Sample data band-pass filter device. 4,920,510, Cl. 364-825.000.
Senderowicz, Daniel: *See*—
Nicollini, Germano; and Senderowicz, Daniel, 4,920,325, Cl. 333-173.000.
Senshu, Takao: *See*—
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Sentell, Karen B.: *See*—
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SGS Microelectronica SpA: *See*—
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Charlet, Pascal; Lauverjat, Eric; and Moreno, Rafael, 4,920,279, Cl. 307-264.000.
SGS-Thomson Microelectronics S.p.A.: *See*—
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Lemaire, Frederic, 4,920,563, Cl. 379-413.000.
Shaak, Ray N.: *See*—
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Bleuel, Eric P.; Ingwersen, Peter; Lickus, Leonard J.; Pellegrino, Thomas P.; Shah, Hasmukh; and Suthard, Robert A., 4,918,804, Cl. 29-33.00M.
Shah, Shreyaunsh R.: *See*—
Pogue, Michael A.; Dempsey, Morgan J.; Shah, Shreyaunsh R.; and Waible, Leo C., III, 4,920,483, Cl. 364-200.000.
Sharp, Janice A.: *See*—
Hoiberg, Dane A.; Hatfield, G. Wesley; Moyed, Harris S.; and Sharp, Janice A., 4,920,055, Cl. 435-147.000.
Sharp Kabushiki Kaisha: *See*—
Aiba, Masahiko, 4,919,499, Cl. 350-6.600.
Hagihara, Hideaki; and Honda, Iwakazu, 4,920,026, Cl. 430-138.000.
Kamiya, Shin; and Ueda, Toru, 4,920,568, Cl. 381-46.000.
Nakanishi, Yasushi; Fukunaga, Takahiro; and Matsumoto, Manabu, 4,920,379, Cl. 355-210.000.
Okamoto, Yuji, 4,920,384, Cl. 355-311.000.
Sakamoto, Noriaki; Nishioka, Yoshiki; Yamanaka, Toshihiro; Horie, Nobuyuki; Kobayashi, Shozou; Deguchi, Toshihisa; and Maeda, Shigemi, 4,920,528, Cl. 369-54.000.
Washo, Junichi; Terashima, Shigeo; Deguchi, Toshihisa; Horii, Masahiro; Hyuga, Takao; and Ohta, Kenji, 4,920,437, Cl. 360-99.050.
Shaw, Scott M.: *See*—
Benson, Richard E.; Gavrilos, Andrew D.; Rand, Robert S.; Shaw, Scott M.; Spafford, Joel W.; and Walko, Ronald J., 4,920,305, Cl. 318-657.000.
Sheehan, Ronald T.; Seymour, Shaun A.; Chow, Mark K.; and Strosser, Richard P., to Ford New Holland, Inc. Apparatus for dispensing a substance onto a crop material at a controlled rate. 4,918,910, Cl. 56-341.000.
Shelestak, Larry J.: *See*—
Pecoraro, George A.; Shelestak, Larry J.; and Cooper, Joseph E., 4,919,697, Cl. 65-134.000.
Pecoraro, George A.; Shelestak, Larry J.; and Cooper, Joseph E., 4,919,700, Cl. 65-134.000.
Shell Internationale Research Maatschappij B.V.: *See*—
Curtze, Jurgen; Schroder, Ludwig; and Briner, Paul H., 4,920,222, Cl. 544-158.000.
Shell Oil Company: *See*—
Kruka, Vitold R.; Kipp, Robert M.; and Cadena, Edward R., 4,920,523, Cl. 367-188.000.
Shepherd, Brian, to Smiths Industries Public Limited Company. Electrical protection assemblies. 4,920,443, Cl. 361-56.000.
Sherman, Harold G.: *See*—
Egger, Shawn E.; and Sherman, Harold G., 4,919,223, Cl. 180-8.100.
Sherwood Medical Company: *See*—
Timothy, Earle J.; Jackson, Edward W.; Mingrone, Joseph A.; Jolie, Jeffrey W.; Nudelman, Dennis L.; and Howard, John F., 4,919,649, Cl. 604-65.000.
Shevlin, Thomas S. Structure for growing mushrooms. 4,918,859, Cl. 47-1.100.
Shibata, Mitsuru; Hiramatsu, Yoshiyuki; Adachi, Ryoichi; and Mitsutake, Kenichiro, to Idemitsu Kosan Company Limited. Trifluoromethanesulfonamide derivative, a method for the preparation thereof and a herbicide containing the same. 4,919,705, Cl. 71-90.000.
Shibata, Satoshi: *See*—
Ueno, Hideo; Shibata, Satoshi; and Yamada, Keiko, 4,919,553, Cl. 400-120.000.
Shibata, Takanori: *See*—
Toyoshima, Nobuyuki; Shibata, Takanori; and Hirashima, Atsushi, 4,920,180, Cl. 525-328.900.
Shibata, Yoshinori: *See*—
Waki, Kokichi; Asami, Masahiro; and Shibata, Yoshinori, 4,920,042, Cl. 430-380.000.
Shida, Masami: *See*—
Manaka, Toshio; Shida, Masami; Sekozawa, Teruji; and Takahashi, Shinsuke, 4,919,094, Cl. 123-326.000.
Manaka, Toshio; and Shida, Masami, 4,919,096, Cl. 123-399.000.
Shida, Takafumi; Arabori, Hideo; Watanabe, Takeo; Kanda, Yohichi; Yamazaki, Shiro; and Shinkawa, Hiroyasu, to Kureha Kagaku Kogyo Kabushiki Kaisha. Derivative of 1,5-diphenyl-1H-1,2,4-triazole-3-carboxamide and herbicidal composition containing the same. 4,919,707, Cl. 71-92.000.
Shigekane, Hisao: *See*—
Itoh, Shinichi; and Shigekane, Hisao, 4,920,405, Cl. 357-74.000.
Shih, Chuan: *See*—
Taylor, Edward C.; Harrington, Philip M.; and Shih, Chuan, 4,920,125, Cl. 514-272.000.
Shih, Shan: *See*—
Trachman, Edward G.; Shih, Shan; and Arzoian, John, 4,919,010, Cl. 475-281.000.
Shillington, Ronald G., to Siemens-Bendix Automotive Electronics Ltd. Integrated tuned induction system. 4,919,086, Cl. 123-52.0MC.
Shimada, Kousaku; Sekozawa, Teruji; and Funabashi, Motohisa, to Hitachi, Ltd. Apparatus and method of electronically controlling engine. 4,919,098, Cl. 123-422.000.
Shimano Industrial Company Limited: *See*—
Nagano, Masashi, 4,919,004, Cl. 74-475.000.
Yamato, Yoshiro, 4,918,852, Cl. 43-22.000.
Shimaoka, Koichi: *See*—
Hosaka, Hideaki; Nakatani, Noboru; Aoki, Kiyotaka; and Shimaoka, Koichi, 4,919,959, Cl. 426-574.000.
Shimizu, Hideki: *See*—
Mima, Toshiyuki; and Shimizu, Hideki, 4,919,217, Cl. 174-139.000.
Shimizu, Ichio; Hoshi, Akio; Okada, Sumio; and Nakamura, Soichiro, to Hitachi, Ltd. Surface mount plastic package semiconductor integrated circuit, manufacturing method thereof, as well as mounting method and mounted structure thereof. 4,920,074, Cl. 437-211.000.
Shimkunas, Alex R.: *See*—
Mauger, Philip E.; Shimkunas, Alex R.; and Yen, Junling J., 4,919,749, Cl. 156-643.000.
Shimoda, Tatsuya: *See*—
Newton, Thomas H.; and Shimoda, Tatsuya, 4,919,858, Cl. 264-24.000.
Shimomura, Tadao: *See*—
Irie, Yoshio; Iwasaki, Kaoru; Hatsuda, Takumi; Kimura, Kazumasa; Harada, Nobuyuki; Ishizaki, Kunihiko; Shimomura, Tadao; and Fujiwara, Teruaki, 4,920,202, Cl. 528-500.000.
Shin, Yuaki: *See*—
Arai, Yuji; Hamada, Emiko; Shin, Yuaki; and Ishiguro, Takashi, 4,920,359, Cl. 346-137.000.
Shinall, Kimberly A. Medical needle removing and disposing system. 4,919,264, Cl. 206-210.000.
Shinkai, Ichiro: *See*—
Askin, David; Jones, Todd K.; Reamer, Robert A.; Volante, Ralph P.; and Shinkai, Ichiro, 4,920,218, Cl. 540-456.000.
Shinkai, Naruto: *See*—
Nakamura, Ichiro; Shinkai, Naruto; Barlow, David; and Nakada, Akio, 4,920,413, Cl. 358-98.000.
Shinkawa, Hiroyasu: *See*—
Shida, Takafumi; Arabori, Hideo; Watanabe, Takeo; Kanda, Yohichi; Yamazaki, Shiro; and Shinkawa, Hiroyasu, 4,919,707, Cl. 71-92.000.
Shinnai, Kohsuke: *See*—
Sasaki, Ryoichi; Nakamura, Tsutomu; Suzuki, Michio; Shinnai, Kohsuke; Ido, Nobuhiko; and Tsunoda, Tomoaki, 4,920,529, Cl. 370-16.000.
Shinohara, Hiroichi, to Ricoh Company, Ltd. Variable focus lens for image reproduction. 4,919,524, Cl. 350-450.000.

Shinohara, Toshiro; Mihara, Teruyoshi; and Yao, Kenji, to Nissan Motor Company, Limited. CMOS having buried layer for carrier recombination. 4,920,396, Cl. 357-42.000.

Shinomiya, Tomohiro: *See*—
Iguchi, Kazuo; Soejima, Tetsuo; Murano, Kazuo; Amemiya, Shigeo; Komine, Hiroaki; Watanabe, Toshiaki; and Shinomiya, Tomohiro, 4,920,546, Cl. 375-106.000.

Shinonaga, Hirohiko: *See*—
Takanashi, Itsuo; Nakagaki, Shintaro; Shinonaga, Hirohiko; Asakura, Tsutou; and Furuya, Masato, 4,920,417, Cl. 358-209.000.

Shinozaki, Fumiaki: *See*—
Totsuka, Mikio; Shinozaki, Fumiaki; Wakata, Yuichi; and Namiki, Tomizo, 4,920,036, Cl. 430-270.000.

Shinozaki, Nobuo: *See*—
Nakagawa, Tadashi; Shinozaki, Nobuo; Koizumi, Hiroyuki; Yamazaki, Hiroshi; Saito, Hiroyuki; Matsushita, Katsuhiko; and Tanikawa, Miyoshi, 4,920,372, Cl. 354-412.000.

Shiokawa, Youichi; Nagano, Masanobu; and Itani, Hiromichi, to Fujisawa Pharmaceutical Company, Ltd. Anti-ulcerative imidazopyridine compounds. 4,920,129, Cl. 514-300.000.

Shiota, Kazuo, to Fuji Photo Film Co., Ltd. Video printer. 4,920,423, Cl. 358-335.000.

Shioya, Jun: *See*—
Mizoguchi, Akira; Shioya, Jun; Yamaguchi, Yoichi; and Ueba, Yoshinobu, 4,919,779, Cl. 204-192.310.

Shipley Company Inc.: *See*—
Bladon, John J., 4,919,768, Cl. 204-15.000.

Shirk, Albert: *See*—
Redmond, John P.; Shaak, Ray N.; and Shirk, Albert, 4,918,814, Cl. 29-878.000.

Shirota, Daigo; Omori, Masao; Yamato, Hiroyasu; and Ogata, Norio, to Idemitsu Petrochemical Company Limited. Method of recovering a lithium chloride. 4,919,911, Cl. 423-499.000.

Shiseido Company Ltd.: *See*—
Nakama, Yasunari; Harusawa, Fuminori; Otsubo, Kyoko; Iwai, Tsunehiko; Tamaki, Shuya; and Ohkoshi, Masahiro, 4,919,846, Cl. 252-542.000.

Shlenker, Robin R. T. Covering such as a glove, condom or sheath for inhibiting the spread of contagious diseases and methods of making and using the same. 4,919,966, Cl. 427-2.000.

Shockey, Rick L.: *See*—
Rydell, Mark A.; and Shockey, Rick L., 4,919,121, Cl. 604-97.000.

Shono, Tetsuji: *See*—
Arai, Akihiro; and Shono, Tetsuji, 4,920,368, Cl. 354-145.100.

Shorr, Leonard M.: *See*—
Segall, Jeane; and Shorr, Leonard M., 4,920,137, Cl. 514-372.000.

Shrimali, Dinesh C.; Steranka, Frank M.; and McLeod, Cheryl L., to Hewlett-Packard Company. Low stress light-emitting diode mounting package. 4,920,404, Cl. 357-72.000.

Shroot, Braham; Eustache, Jacques; and Bernardon, Jean-Michel, to Centre International de Recherches Dermatologiques C.I.R.D. Benzimidazole derivatives and their thereapeutic and cosmetic use. 4,920,140, Cl. 514-394.000.

Shulik, Larry J.; Sartori, Guido; Ho, W. S. Winston; Thaler, Warren; and Milliman, George E., to Exxon Research and Engineering Company. Primary hindered aminoacids for promoted acid gas scrubbing process. 4,919,904, Cl. 423-225.000.

Shultz, Allan R.: *See*—
Langer, Matthew E.; Policastro, Peter P.; and Shultz, Allan R., 4,920,191, Cl. 528-26.000.

Shutske, Gregory M., to Hoechst-Roussel Pharmaceuticals Inc. 4,5,5a,6-tetrahydro-3H-isoxazolo(5,4,3-kl)acridines, pharmaceutical compositions and use. 4,920,117, Cl. 514-212.000.

Shyu, Jia-Ming; and Chang, Chih-Li, to Industrial Technology Research Institute. Automatic working vehicular system. 4,919,224, Cl. 180-168.000.

Sibalis, Dan, to Drug Delivery Systems Inc. High tack drug patch. 4,919,648, Cl. 604-20.000.

Siddons Industries Limited: *See*—
De Forest, Lockwood; Roberts, Ian D.; and Dixon, Christoper W. S., 4,918,938, Cl. 62-238.600.

Siegel, Carole E.: *See*—
Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., 4,920,149, Cl. 514-557.000.

Siegmund, Walter P., to Schott Fiber Optics. Low-cost semi-disposable endoscope. 4,919,112, Cl. 128-4.000.

Siemens Aktiengesellschaft: *See*—
Beier, Helmut; Bohrdt, Joaquin-Conrado; and Schuler, Klaus, 4,920,242, Cl. 200-148.00B.
Budde, Klaus; Nuyken, Oskar; and Melchior, Walter, 4,920,038, [illegible] 430-315.000.
Duerr, Wilhelm; and Oppelt, Ralph, 4,920,522, Cl. 367-134.000.
Frankenberg, Wolfgang; Laber, Hans; and Weschta, Alois, 4,920,473, Cl. 363-96.000.
Marx, Juergen; and Weich, Artur, 4,920,365, Cl. 368-242.000.
Preidel, Walter; and Mund, Konrad, 4,919,770, Cl. 204-153.100.
Schweikert, Wilhelm; Will, Norbert; and Lauer, Wilhelm, 4,920,457, Cl. 361-530.000.
Stickel, Heinz; and Reihl, Peter, 4,918,954, Cl. 70-134.000.

Siemens-Bendix Automotive Electronics Ltd.: *See*—
Shillington, Ronald G., 4,919,086, Cl. 123-52.0MC.

Siemens Medical Systems, Inc.: *See*—
Egloff, Heinz, 4,920,316, Cl. 324-318.000.

Siemer, David R.: *See*—
Menardi, Elaine A.; Rhodes, Terrence E.; and Siemer, David R., 4,919,799, Cl. 209-538.000.

Sierracin Corporation: *See*—
DeCamp, Howard S.; Raffo, John A.; and Bimanand, Alex Z., 4,920,254, Cl. 219-547.000.

Sigl, Wayne C.; and Murray, Frank C., to Kimberly-Clark Corporation. Powder-coated laundry detergent sheet. 4,919,835, Cl. 252-91.000.

Sigworth, William D.: *See*—
Cesare, Frank C.; Davis, Robert G.; and Sigworth, William D., 4,919,976, Cl. 427-373.000.

Sikka, Vinod K.: *See*—
Hobson, David O.; Alexeff, Igor; and Sikka, Vinod K., 4,919,335, Cl. 239-3.000.

Silbermann, Joseph: *See*—
Conrad, Neal; Burchill, Michael T.; Silbermann, Joseph; Hoffman, Thomas; and Bourrel, Maurice, 4,919,972, Cl. 427-160.000.

Siliconix Incorporated: *See*—
Blanchard, Richard A.; and Cogan, Adrian I., 4,920,388, Cl. 357-23.400.

Siltec Corporation: *See*—
Torbert, Walter; Struves, Kenneth C.; Lorenzini, Robert E.; and Bonora, Anthony C., 4,918,870, Cl. 51-131.300.

Silverman, Howard P.: *See*—
Blum, Ronald D.; Reid, Scott; and Silverman, Howard P., 4,919,850, Cl. 264-1.400.

Simons, Peter G. M.: *See*—
den Heijer, Ronald; Goverde, Godefridus C.; and Simons, Peter G. M., 4,920,288, Cl. 310-15.000.

Simpson, Davis W. Trap for catching animals. 4,918,855, Cl. 43-85.000.

Simpson, Penny C.: *See*—
Lee, Chi-Chang; and Simpson, Penny C., 4,920,001, Cl. 428-289.000.

Sims, Anthony M. Two-way flow valve. 4,919,166, Cl. 137-493.000.

Sinchok, John D.: *See*—
Olson, John B.; Jeanson, Richard L.; and Sinchok, John D., 4,919,250, Cl. 194-248.000.

Sinha, Sudhir K.: *See*—
Gottlieb, A. Arthur; Sizemore, Robert C.; and Sinha, Sudhir K., 4,920,097, Cl. 514-2.000.

SIPRA Patententwicklungs- u.Beteiligungsgesellschaft mbH: *See*—
Nurk, Seigfried, 4,918,948, Cl. 66-132.00T.

Sinkovic, Christopher: *See*—
Bartosiak, George; Sinkovic, Christopher; Tap, Henry H.; Paris, Sam; and Goldberg, Arthur E., 4,919,505, Cl. 350-96.180.

Sissenstein, David W., Jr.: *See*—
Elmgren, Peter J.; Emerick, Alan J.; Rivenburg, Dennis L., Sr.; Saraiya, Mukund K.; and Sissenstein, David W., Jr., 4,919,729, Cl. 148-24.000.

Sizemore, Robert C.: *See*—
Gottlieb, A. Arthur; Sizemore, Robert C.; and Sinha, Sudhir K., 4,920,097, Cl. 514-2.000.

Skeirik, Richard D., to Du Pont de Nemours, E. I., and Company. Expert system with natural-language rule updating. 4,920,499, Cl. 364-513.000.

SKF Industrial Trading & Development Company, B.V.: *See*—
Lankamp, Herman, 4,919,550, Cl. 384-133.000.

Skipper, Hugh W. Variable centrifugal brake. 4,919,238, Cl. 188-186.000.

Skirha, Martin D.: *See*—
Savage, Russell C.; Zeller, Gary P.; and Skirha, Martin D., 4,919,876, Cl. 264-258.000.

Skyline Displays, Inc.: *See*—
Beaulieu, Bryan, 4,919,259, Cl. 206-45.200.

Slate, John B.; and Henke, James L., to Pacesetter Infusion, Ltd. Fluid delivery control and monitoring apparatus for a medication infusion system. 4,919,596, Cl. 417-18.000.

Slomski, Edward J.: *See*—
Lems, Peter; and Slomski, Edward J., 4,919,265, Cl. 206-432.000.

Small, James E.: *See*—
McCoy, William C.; Small, James E.; and Cole, Gregory, 4,918,919, Cl. 60-528.000.

Smith, David A.; and Woody, Clark M., to Dow Chemical Company, The. Multiple delivery system. 4,919,415, Cl. 271-284.000.

Smith, Dennis C.: *See*—
Murray, Douglas G.; Smith, Dennis C.; and Guillet, James E., 4,920,158, Cl. 523-111.000.

Smith, Edward: *See*—
Doyle, Thomas D.; Brunner, Charlotte A.; and Smith, Edward, 4,919,803, Cl. 210-198.200.

Smith Investment Company: *See*—
Benting, Gary M., 4,918,767, Cl. 4-517.000.

Smith, James W.; Barton, Robert A.; and Knight, Cyril H., deceased (by James, Leslie), to 780863 Ontario Limited. Removal of hydrogen sulphide from gaseous streams. 4,919,914, Cl. 423-576.200.

Smith, Jay C.; McCord, Thomas H.; and O'Neil, Gregory R., to Freeport McMoRan Inc. Treating refractory gold ores via oxygen-enriched roasting. 4,919,715, Cl. 75-423.000.

Smith, John W.: *See*—
Hann, Richard A.; Holmes, David R.; and Smith, John W., 4,920,193, Cl. 528-171.000.

Smith, Lloyd H.: *See*—
Jones, Lynn A.; Smith, Lloyd H.; and Teng, Nelson N. H., 4,919,889, Cl. 422-40.000.

Smith, Michael E.: *See*—
Smith, Richard W., Jr.; and Smith, Michael E., 4,919,092, Cl. 123-188.00M.
Smith, Redd H.; and Lund, Jeffrey B., to Eastman Christensen Company. Preformed elements for a rotary drill bit. 4,919,013, Cl. 76-108.200.
Smith, Richard L.; Wallner, Frederick; and Weed, Alvern C. Collapsible one-man pontoon fishing raft. 4,919,632, Cl. 441-44.000.
Smith, Richard W., Jr.; and Smith, Michael E., to TFS, Inc. In-line cylinder head for internal combustion engine. 4,919,092, Cl. 123-188.00M.
Smith, Robert M.: *See*—
Sovis, John F.; Smith, Robert M.; and Bramball, George H., 4,918,781, Cl. 15-392.000.
Smith, Terry E.: *See*—
Cho, James R.; Smith, Terry E.; and Cottrell, Ian W., 4,920,145, Cl. 514-420.000.
Smith, Thomas D.: *See*—
Schwarz, Kurt K.; and Smith, Thomas D., 4,918,801, Cl. 29-596.000.
Smiths Industries Public Limited Company: *See*—
Shepherd, Brian, 4,920,443, Cl. 361-56.000.
SMS Schloemann-Siemag Aktiengesellschaft: *See*—
Engel, Georg; and Haberer, Ernst-August, 4,918,964, Cl. 72-225.000.
Snap-on Tools Corporation: *See*—
Huebschen, David A., 4,919,020, Cl. 81-125.000.
Sneddon, Gordon R.: *See*—
Mollett, Christopher C.; and Sneddon, Gordon R., 4,919,754, Cl. 162-5.000.
Snyder, George K., to General Motors Corporation. Method and apparatus for processing continuously manufactured tubing. 4,919,025, Cl. 83-54.000.
SOC Corporation: *See*—
Arikawa, Hiroo; and Yuza, Yasutada, 4,920,327, Cl. 337-231.000.
Societe Alsacienne d'Aluminium: *See*—
Rebischung, Robert A., 4,919,742, Cl. 156-269.000.
Societe Anonyme Dite Hispano Suiza: *See*—
Gery, Daniel E.; and Meunier, Philippe, 4,919,194, Cl. 165-1.000.
Societe Anonyme dite: Stein Industrie: *See*—
Patron, Henri, 4,919,198, Cl. 165-81.000.
S.A. Societe d'Etudes et d'Applications Industrielles: *See*—
Trivino Vazquez, Fernando; and Clenin, Roger J., 4,919,722, Cl. 106-97.000.
Societe Chimique de la Grande Paroisse: *See*—
Lesur, Pierre; Faury, Christian; Lafleur, Guy; and Papillon, Andre , 4,919,909, Cl. 423-360.000.
Societe d'Administration et de Realisations d'Investissements (SARI): *See*—
Elluin, Patrice; Verrecchia, Pascal; Mauer, Georges; and Cardon, Philippe, 4,919,327, Cl. 236-49.100.
Societe Francaise Bitumastic: *See*—
Cussot, Christian; and Delage, Jean-Didier, 4,920,002, Cl. 428-325.000.
Soejima, Tetsuo: *See*—
Iguchi, Kazuo; Soejima, Tetsuo; Murano, Kazuo; Amemiya, Shigeo; Komine, Hiroaki; Watanabe, Toshiaki; and Shinomiya, Tomohiro, 4,920,546, Cl. 375-106.000.
Watanabe, Toshiaki; Iguchi, Kazuo; Soejima, Tetsuo; and Obta, Shinji, 4,920,535, Cl. 370-105.100.
Sogabe, Mitsushi: *See*—
Koike, Hiroyuki; Hata, Yukihiro; and Sogabe, Mitsushi, 4,919,388, Cl. 249-115.000.
Soilizer Corporation: *See*—
Weltzien, Robert F.; and Berlyn, Graeme, 4,919,702, Cl. 71-24.000.
Sollami, Phillip A. Rotor vane and shaft assembly. 4,919,040, Cl. 92-125.000.
Son, Pyong N.: *See*—
Lai, John Ta-Yuan; and Son, Pyong N., 4,920,228, Cl. 546-224.000.
Soniform, Inc.: *See*—
Cirket, Morgan T.; and Duly, Michael J., 4,918,790, Cl. 24-71.00R.
Sonobe, Tadasi: *See*—
Ishigaki, Yukio; and Sonobe, Tadasi, 4,920,095, Cl. 505-1.000.
Sonoda, Takakuni: *See*—
Akao, Michitoshi; Sakakibara, Kenji; Katoh, Tokunori; Sawaki, Yukichi; Sonoda, Takakuni; and Suzuki, Makoto, 4,920,375, Cl. 355-27.000.
Yamamoto, Takemi; Sakai, Jun; and Sonoda, Takakuni, 4,920,376, Cl. 355-38.000.
Sony Corporation: *See*—
Hasebe, Atsushi; and Kato, Ryohei, 4,920,482, Cl. 364-200.000.
Takeshita, Kaneyoshi; and Matsushita, Takeshi, 4,920,513, Cl. 365-175.000.
Yanagibori, Masami, 4,919,640, Cl. 455-164.000.
Sony Creative Products Incorporation: *See*—
Saito, Yasuhiko, 4,920,526, Cl. 368-281.000.
Sougioltzis, Vasilios: *See*—
Handke, Heinz; Zink, Thomas; and Sougioltzis, Vasilios, 4,919,967, Cl. 427-8.000.
Sovis, John F.; Smith, Robert M.; and Bramball, George H., to Royal Appliance Mfg. Co. Hand vacuum cleaner. 4,918,781, Cl. 15-392.000.
Spafford, Joel W.: *See*—
Benson, Richard E.; Gavrilos, Andrew D.; Rand, Robert S.; Shaw, Scott M.; Spafford, Joel W.; and Walko, Ronald J., 4,920,305, Cl. 318-657.000.
Speakman, William J., Jr. Trailer. 4,919,583, Cl. 414-528.000.
Specified Equipment Systems Co., Inc.: *See*—
Kistner, Kenneth J., 4,919,597, Cl. 417-403.000.
Spector, George: *See*—
Searle, William M.; and Spector, George, 4,919,213, Cl. 172-350.000.
Spectranetics Corporation, The: *See*—
Grace, Kenneth P.; and Aparicio, Facundo, 4,919,508, Cl. 350-96.200.
Spectrum Consumer Products Co., Inc.: *See*—
Cole, B. Harrison; Kroeger, Donald C.; and Wilson, Mark E., 4,919,918, Cl. 424-44.000.
Spehr, Paul R.: *See*—
Phillips, Richard E., Jr.; and Spehr, Paul R., 4,919,135, Cl. 128-419.00P.
Speich, Francisco, to Textilma AG. Knitting machine for producing warp knit. 4,918,947, Cl. 66-203.000.
Spence, Jerry L., to InstruMed, Inc. Seals and method of sealing for a sterilization container system. 4,919,888, Cl. 422-26.000.
Sperry Marine Inc.: *See*—
Gerdt, David W.; and Gilligan, Lawrence H., 4,920,412, Cl. 358-95.000.
Spetsializirovannoe Konstruktorskoe Bjuro No Komplexam Machin Dlya Dvukhfaznoi Uborki: *See*—
Yarmashev, Jury N.; Zapandi, Vladimir A.; Tkachev, Valentin N.; and Peder, Olev I., 4,919,641, Cl. 460-69.000.
Spicher, Ulrich: *See*—
Pischinger, Franz; Spicher, Ulrich; and Heuser, Georg, 4,918,982, Cl. 73-116.000.
Spindler, Manfred; and Tanner, Herbert, to Degussa Aktiengesellschaft. Use of Aqueous L-lysine solutions for supplementing feeds and indistrially produced mixed feeds with L-lysine. 4,919,945, Cl. 426-69.000.
Spindler, Siegfried W., to Ries GmbH Bekleidungsverschlussfabrik. Zip fastener and a process for its manufacture. 4,918,793, Cl. 24-392.000.
Spingler, John O.: *See*—
Orr, Avigdor; Spingler, John O.; and Gilbert, Seymour G., 4,919,948, Cl. 426-106.000.
Spinner, Ralphael F., deceased; and Marley, Clement F. Mechanical knot for ropes. 4,918,785, Cl. 16-114.00B.
Spota, Angel H. L. Muzzle-loading firearm. 4,918,849, Cl. 42-51.000.
Spranger, Douglas M.: *See*—
Bracker, Jeffrey; Kirk, Karl D., III; and Spranger, Douglas M., 4,919,656, Cl. 604-192.000.
Spry, Piper A.: *See*—
Keller, Stephen A.; Spry, Piper A.; Adams, Martha S.; and Harper, Ralph G., 4,920,072, Cl. 437-192.000.
Square D Company: *See*—
Bartosiak, George; Siskovic, Christopher; Tap, Henry H.; Paris, Sam; and Goldberg, Arthur E., 4,919,505, Cl. 350-96.180.
Harris, Geoffrey J., 4,920,281, Cl. 307-308.000.
SRI International: *See*—
Becker, Christopher H., 4,920,264, Cl. 250-282.000.
Sta-Rite Industries: *See*—
Junk, Richard A., 4,919,338, Cl. 239-587.000.
Staalkat B.V.: *See*—
von Asselt, Peter A.; and Hordyk, Jan, 4,919,798, Cl. 209-510.000.
Stabler, Manfred: *See*—
Barth, Walter; Braunbach, Karl-Heinz; and Stabler, Manfred, 4,918,868, Cl. 51-120.000.
Stafford, Michael V. Underwater diving system. 4,919,631, Cl. 441-40.000.
Stafford, Thomas A. Garage door antisag device. 4,918,890, Cl. 52-291.000.
Stanchak, Carl M.: *See*—
Henderson, David L.; and Stanchak, Carl M., 4,920,344, Cl. 341-118.000.
Standard Oil Company, The: *See*—
Davis, James C., 4,919,811, Cl. 210-500.360.
Standard Textile Co., Inc.: *See*—
Goad, Conrad D.; and Taylor, Jeffrey L., 4,919,998, Cl. 428-265.000.
Stanek, Edward F.: *See*—
Terp, Gerald W.; and Stanek, Edward F., 4,919,352, Cl. 242-56.00A.
Stang, Michael A. Contraception and flavor delivery system. 4,919,149, Cl. 128-842.000.
Stankus, John J.: *See*—
Hoebener, Karl G.; and Stankus, John J., 4,919,970, Cl. 427-96.000.
Stanley Works, The: *See*—
Govang, James A.; and Goldstein, Mark E., 4,919,270, Cl. 206-597.000.
Starkey, James R.: *See*—
Pearce, Derry F.; Dimitriadis, Eugene; and Starkey, James R., 4,918,979, Cl. 73-61.10R.
State University of New York: *See*—
Upadhyaya, Shambhu J.; and Demjanenko, Michael, 4,920,497, Cl. 364-491.000.
Stauffer, Larry R.: *See*—
Bowen, Terry P.; Deeg, Emil W.; Helm, James G.; and Stauffer, Larry R., 4,920,366, Cl. 350-96.200.
Stavitsky, Robert, to LeaRonal, Inc. Electroless gold plating solutions. 4,919,720, Cl. 106-1.260.
Steer, David G.: *See*—
Strawczynski, Leo; and Steer, David G., 4,920,565, Cl. 380-6.000.
Stefan, Alexander. Rescue system for tall buildings. 4,919,228, Cl. 182-14.000.

Stegemoeller, Calvin L.; and Davis, Gail F., to Halliburton Company. Self-leveling mixer apparatus. 4,919,540, Cl. 366-132.000.
Stehn, Werner, to Electronic-Werke Deutschland GmbH. Loudspeaker mounting mechanism. 4,919,369, Cl. 248-27.300.
Stein, Geoffery, to Mor-Flo Industries, Inc. Display stand for use with water heaters. 4,918,848, Cl. 40-584.000.
Steinhilber, Wilhelm A. Nail making machine. 4,918,809, Cl. 29-792.000.
Stemmle, Denis J., to Xerox Corporation. Sheet handling apparatus with narrow belt having raised frictional contact element. 4,919,409, Cl. 271-34.000.
Stemmle, Denis J., to Xerox Corporation. Simultaneous read/write copier. 4,920,421, Cl. 358-296.000.
Stenzel, Otto: *See*—
Rupp, Hartwig; and Stenzel, Otto, 4,919,187, Cl. 164-57.100.
Stephen C. Gabeler: *See*—
Gabeler, Stephen C., 4,920,255, Cl. 235-454.000.
Stepp, Herbert: *See*—
Baumgartner, Reinhold; Lenz, Hans; Stepp, Herbert; and Unsold, Eberhard, 4,920,541, Cl. 372-23.000.
Stepper, Inc.: *See*—
Hannon, Charles N., 4,919,413, Cl. 271-133.000.
Steranka, Frank M.: *See*—
Shrimali, Dinesh C.; Steranka, Frank M.; and McLeod, Cheryl L., 4,920,404, Cl. 357-72.000.
Sterling Drug Inc.: *See*—
Bell, Malcolm R.; and Ackerman, James H., 4,920,128, Cl. 514-293.000.
Sternberg, Ethan: *See*—
Levy, Julia G.; Dolphin, David; Chow, Jack K.; and Sternberg, Ethan, 4,920,143, Cl. 514-410.000.
Stevenson, George F.; and Cassidy, Ronald F., to Normalair-Garrett (Holdings) Ltd. Aircraft aircrew life support systems. 4,919,124, Cl. 128-202.260.
Stewart, Douglas V., to Reynolds Metals Company. Alumina reduction cell. 4,919,782, Cl. 204-243.00R.
Stice, David L. Vehicle parking or passageway security barrier. 4,919,563, Cl. 404-6.000.
Stickel, Heinz; and Reihl, Peter, to Siemens Aktiengesellschaft. Lock mechanism for equipment of data processing technology. 4,918,954, Cl. 70-134.000.
Sto Aktiengesellschaft: *See*—
Kubbutat, Albert F., 4,919,866, Cl. 264-45.300.
Stocker, Hans J.: *See*—
Bredbenner, Craig N.; Giniecki, Troy A.; Selamoglu, Nur; and Stocker, Hans J., 4,919,748, Cl. 156-643.000.
Stocker, Werner: *See*—
Fink, Hans-Werner; Morin, Roger; Schmid, Heinz; and Stocker, Werner, 4,919,780, Cl. 204-192.340.
Stoddard, James C., to GTE Laboratories Incorporated. Composite video frame store. 4,920,407, Cl. 358-21.00R.
Stoisser, Gunther: *See*—
Ritter, Gerhard; Ritter, Klaus; and Stoisser, Gunther, 4,919,395, Cl. 266-103.000.
Stoklosa, David P.; Pedicini, Christopher S.; and Pattantyus, Imre A., to Eveready Battery Company, Inc. Battery pack assembly having a circuit board. 4,920,019, Cl. 429-122.000.
Stoll, Mark S., to Liberty Diversified Industries. Nestable and stackable tote containers. 4,919,267, Cl. 206-507.000.
Stolle Research & Development Corporation: *See*—
Beck, Lee R., 4,919,929, Cl. 424-88.000.
Stone, Earlyn W.: *See*—
Whitenack, Joan E.; Sanchez, George; Stone, Earlyn W.; and Colton, Buddy A., 4,920,251, Cl. 219-401.000.
Stone & Webster Engineering Corp.: *See*—
Gartside, Robert J.; and Norton, Richard C., 4,919,898, Cl. 422-219.000.
Stopper, Herbert; and Perkins, Cornelius C., to Mosaic Systems, Inc. Wafer scale package system and header and method of manufacture thereof. 4,920,454, Cl. 361-398.000.
Storace, Anthony, to Technalytics, Inc. Surgical stapler. 4,919,320, Cl. 227-19.000.
Stoutamire, Mark S.: *See*—
Bucher, George D.; DiGrande, John T.; Frye, Lester C.; and Stoutamire, Mark S., 4,918,991, Cl. 73-864.000.
Stoy, Michael A.; Dusek, Vaclav; Patel, Anilbhai S.; and Herriott, Ray G., to Nestle S.A. Tool for inserting compressible intraocular lenses into the eye and method. 4,919,130, Cl. 606-107.000.
Strabag Bau-AG: *See*—
Bergfelder, Jurgen, 4,919,572, Cl. 405-212.000.
Stranco, Inc.: *See*—
Brazelton, Carl L.; Litherland, Troy C.; and Johnston, James G., 4,920,519, Cl. 366-161.000.
Strange, Robert A.: *See*—
Miltz, Joseph; Strange, Robert A.; and McDilda, Joseph C., 4,919,949, Cl. 426-128.000.
Strasilla, Dieter: *See*—
Manser, Aloynius H.; Strasilla, Dieter; and Mulhaupt, Rolf, 4,920,182, Cl. 525-438.000.
Stratford, Brian S.; Hadaway, Edward S.; Chew, John; and Hartland, Howard G., to Rolls-Royce plc. Compressor and air bleed arrangement. 4,919,590, Cl. 415-116.000.
Stratus Computer, Inc.: *See*—
Baty, Kurt F., 4,920,540, Cl. 371-61.000.
Strauven, Ivan A.; and Meeus, Marcel L., to Metallurgie Hoboken-Overpelt. Zinc powder for alkaline batteries. 4,920,020, Cl. 429-230.000.
Strawczynski, Leo; and Steer, David G., to Northern Telecom Limited. Method for connection of secure conference calls. 4,920,565, Cl. 380-6.000.
Streeter, James M., to Becton, Dickinson and Company. Thermoelectric chiller and automatic syringe. 4,919,134, Cl. 128-400.000.
Stroble, Carl P.: *See*—
Salsgiver, James A.; Knipe, Randal K.; and Stroble, Carl P., 4,919,733, Cl. 148-113.000.
Strosser, Richard P.: *See*—
Sheehan, Ronald T.; Seymour, Shaun A.; Chow, Mark K.; and Strosser, Richard P., 4,918,910, Cl. 56-341.000.
Struck, Dennis L.: *See*—
Banyai, Bruce E.; LaSota, Denis E.; and Struck, Dennis L., 4,919,711, Cl. 75-321.000.
Struven, Kenneth C.: *See*—
Torbert, Walter; Struven, Kenneth C.; Lorenzini, Robert E.; and Bonora, Anthony C., 4,918,870, Cl. 51-131.300.
Stryker Corporation: *See*—
Richmond, James W., 4,919,667, Cl. 623-18.000.
Stubmer, Karl-Gerhart; Koch, Rudolf; and Frey, Otto, to Sulzer Brothers Limited. Prosthetic acetabulum. 4,919,677, Cl. 623-22.000.
Stumpe, Werner: *See*—
Samuelson, Hakan; Thoms, Eric; Grauel, Ingolf; Stumpe, Werner; and Maurer, Franz, 4,919,492, Cl. 303-3.000.
Stupp, Edward H.: *See*—
Bruning, Gert W.; and Stupp, Edward H., 4,920,474, Cl. 363-97.000.
Sturges, Daniel D. Platform oriented transportation vehicle. 4,919,225, Cl. 180-210.000.
Su, Eugene C.: *See*—
Gandhi, Haren S.; and Su, Eugene C., 4,919,903, Cl. 423-213.500.
Subbotin, Anatoly N.: *See*—
Lipukhim, Jury V.; Danilov, Leonid I.; Garber, Eduard A.; and Subbotin, Anatoly N., 4,918,960, Cl. 72-40.000.
Suda, Hirofumi: *See*—
Kaneda, Naoya; Wada, Hiroyuki; Hirasawa, Mashide; and Suda, Hirofumi, 4,920,369, Cl. 354-400.000.
Suda, Yoshihisa, to Mitsubishi Pencil Co., Ltd. Process of making an acoustic carbon diaphragm. 4,919,859, Cl. 264-29.500.
Suffi, Louis, to Reliance Comm/Tex Corporation. Insulation displacing terminal. 4,919,622, Cl. 439-395.000.
Sugaya, Tadashi: *See*—
Miyoshi, Ryota; Imai, Isao; and Sugaya, Tadashi, 4,919,922, Cl. 424-63.000.
Suggitt, Robert M.; and Najjar, Mitri S., to Texaco Inc. Gasifier with gas scroured throat. 4,919,688, Cl. 48-69.000.
Sugimoto, Minoru: *See*—
Horikoshi, Tadao; Naganuma, Hisao; Sugimoto, Minoru; and Numao, Masanobu, 4,919,120, Cl. 126-93.000.
Sugioka, Takao: *See*—
Ogawa, Souichi; Sugioka, Takao; and Inoue, Masaru, 4,920,011, Cl. 428-596.000.
Sugita, Kazuhiko; Hotta, Shigeo; Matsuda, Osamu; and Yamakawa, Yoichi, to Toyoda Koki Kabushiki Kaisha. Object recognition system for a robot. 4,920,572, Cl. 382-48.000.
Sugiura, Saburo; Fujita, Senji; Nakata, Hiroya; Okamoto, Tetsuo; Inagaki, Yoshio; Mizuguchi, Keiichi; and Ishii, Atsushi, to Daido Tokushuko Kabushiki Kaisha. Method and apparatus for refining steel. 4,919,714, Cl. 75-529.000.
Sukup, Charles E.: *See*—
Sukup, Eugene G.; Sukup, Charles E.; and Sukup, Steven, 4,919,642, Cl. 460-80.000.
Sukup, Eugene G.; Sukup, Charles E.; and Sukup, Steven, to Sukup Manufacturing Company. Rotary grain screener. 4,919,642, Cl. 460-80.000.
Sukup Manufacturing Company: *See*—
Sukup, Eugene G.; Sukup, Charles E.; and Sukup, Steven, 4,919,642, Cl. 460-80.000.
Sukup, Steven: *See*—
Sukup, Eugene G.; Sukup, Charles E.; and Sukup, Steven, 4,919,642, Cl. 460-80.000.
Sullivan, Bernard P.: *See*—
DeVore, Dale P.; Swann, David A.; and Sullivan, Bernard P., 4,920,104, Cl. 514-54.000.
Sullivan, James R.; and Miller, Rodney L., to Eastman Kodak Company. Digital halftoning with minimum visual modulation patterns. 4,920,501, Cl. 364-518.000.
Sulzer Brothers Limited: *See*—
Buchhorn, Ursula; and Willert, Hans B., 4,919,666, Cl. 623-16.000.
Dietschi, Carlo, 4,919,675, Cl. 623-22.000.
Grosz-Roell, Fritz; Mutsakis, Michael; and Rader, Robert G., 4,919,541, Cl. 366-136.000.
Karpf, Kurt, 4,919,671, Cl. 623-20.000.
Stubmer, Karl-Gerhart; Koch, Rudolf; and Frey, Otto, 4,919,677, Cl. 623-22.000.
Willert, Hans-Georg; and Semlitsch, Manfred, 4,919,673, Cl. 623-23.000.
Zweymuller, K.; and Koch, Rudolf, 4,919,676, Cl. 623-22.000.
Sumigawa, Yukio: *See*—
Isogawa, Atsushi; and Sumigawa, Yukio, 4,919,629, Cl. 440-62.000.
Sumita, Masaya; and Akiyama, Hitoshi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Method for producing porous sintered apatite material. 4,919,751, Cl. 156-646.000.

Sumitomo Chemical Company, Limited: *See*—
Ohmae, Tadayuki; Mashita, Kentaro; Yamaguchi, Noboru; Asao, Kouichiro; Kondo, Norio; and Sakurai, Tadashi, 4,919,757, Cl. 162-164.300.
Sumitomo Durez Company, Ltd.: *See*—
Tokunaga, Yukio; and Saeki, Yukio, 4,920,185, Cl. 525-506.000.
Tokunaga, Yukio; and Saeki, Yukio, 4,920,186, Cl. 525-506.000.
Sumitomo Metal Mining Co., Ltd.: *See*—
Hirai, Toshio; and Yamane, Hisanori, 4,920,014, Cl. 428-698.000.
Sun Refining and Marketing Company: *See*—
Tsao, Hsiang-Wei, 4,919,816, Cl. 210-638.000.
Sundell, Robert E.: *See*—
McLaughlin, Michael H.; Penney, Carl M.; and Sundell, Robert E., 4,920,249, Cl. 219-130.210.
Sundstrand Data Control, Inc.: *See*—
Woodruff, James R., 4,919,993, Cl. 428-134.000.
Sung, Rodney L.: *See*—
DeBlase, Frank J.; Daly, Daniel T.; Sung, Rodney L.; and Wetherbee, Clifton W., 4,920,058, Cl. 436-85.000.
Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., to Analgesic Associates. Cough/cold mixtures comprising non-steroidal anti-inflammatory drugs. 4,920,149, Cl. 514-557.000.
Suntory Limited: *See*—
Cho, Hidetsura; and Ueda, Masaru, 4,920,124, Cl. 514-256.000.
Naruse, Hiroshi; Takesada, Masashi; Hayashi, Osamu; and Watanabe, Yasuyoshi, 4,920,122, Cl. 514-254.000.
Suomala, John E.: *See*—
Menard, Alan W.; Suomala, John E.; and Walker, Richard A., 4,919,701, Cl. 65-158.000.
Super Sagless Corp.: *See*—
Hartline, Michael F.; and White, Nikki O., 4,918,770, Cl. 5-13.000.
Tacker, Bill D., 4,919,478, Cl. 297-85.000.
Superstill Technology, Inc.: *See*—
Sears, Stephan B.; and Pomeroy, Dan M., 4,919,592, Cl. 415-207.000.
Suthard, Robert A.: *See*—
Bleuel, Eric P.; Ingwersen, Peter; Lickus, Leonard J.; Pellegrino, Thomas P.; Shah, Hasmukh; and Suthard, Robert A., 4,918,804, Cl. 29-33.00M.
Suvanto, Erkki: *See*—
Linden, Unto; and Suvanto, Erkki, 4,919,181, Cl. 152-210.000.
Suzuki, Hirosi: *See*—
Tokumasu, Osamu; Kuzuha, Yoshihiro; Suzuki, Hirosi; and Awata, Bunichiro, 4,918,832, Cl. 29-606.000.
Suzuki, Kazuaki, to Nikon Corporation. Projection exposure apparatus. 4,920,505, Cl. 364-525.000.
Suzuki, Keitaro: *See*—
Abe, Makoto; Tanimoto, Ichiro; Fujiki, Akira; Suzuki, Keitaro; Endo, Hiroyuki; and Ikenoue, Yutaka, 4,919,719, Cl. 75-243.000.
Suzuki, Makoto: *See*—
Akao, Michitoshi; Sakakibara, Kenji; Katoh, Tokunori; Sawaki, Yukichi; Sonoda, Takakuni; and Suzuki, Makoto, 4,920,375, Cl. 355-27.000.
Suzuki, Masahiro: *See*—
Yamamoto, Haruhiko; Suzuki, Masahiro; Udagawa, Yoshiaki; Nakata, Mitsuhiko; Katsuyama, Koji; Ono, Izumi; and Kikuchi, Shunichi, 4,920,574, Cl. 361-385.000.
Suzuki, Michio: *See*—
Sasaki, Ryoichi; Nakamura, Tsutomu; Suzuki, Michio; Shinnai, Kohsuke; Ido, Nobuhiko; and Tsunoda, Tomoaki, 4,920,529, Cl. 370-16.000.
Suzuki, Osamu: *See*—
Oishi, Kengo; and Suzuki, Osamu, 4,919,873, Cl. 264-130.000.
Suzuki, Shigeru: *See*—
Mashiko, Harumitsu; Seto, Takashi; and Suzuki, Shigeru, 4,919,531, Cl. 355-27.000.
Suzuki, Yuji: *See*—
Tashiro, Yasunori; and Suzuki, Yuji, 4,919,587, Cl. 414-795.800.
Swana, David A.: *See*—
DeVore, Dale P.; Swana, David A.; and Sullivan, Bernard P., 4,920,104, Cl. 514-54.000.
Swath Ocean Systems, Inc.: *See*—
Hall, Nelson W.; and Kotzebue, Paul, 4,919,063, Cl. 114-56.000.
Sweatman, Gerald H.; Hodgson, Roy; and Haste, Robert H., to Xerox Corporation. Control of selenium alloy fractionation. 4,920,025, Cl. 430-128.000.
Swedo, Raymond J.; and Zupancic, Joseph J., to Allied-Signal Inc. Semipermeable membrane compositions. 4,919,808, Cl. 210-490.000.
SWF Auto-Electric GmbH: *See*—
Buhler, Roland; Erdelitsch, Herbert; Hecht, Walter; and Rachner, Horst, 4,920,239, Cl. 200-61.540.
Swidwa, Kenneth J.: *See*—
Hankinson, Michael F.; Swidwa, Kenneth J.; and Salton, Robert B., 4,919,881, Cl. 376-260.000.
Swisher, George W., Jr. Drum mixer having a combined mixing and heating zone. 4,919,538, Cl. 366-4.000.
Syquest Technology: *See*—
Couse, Robert F.; and Mercer, Patrick G., 4,920,462, Cl. 360-78.040.
Szczebak, Ed, Jr., to Reliance Comm/Tec Corporation. Apparatus and method for calculating signal level in decibels. 4,920,496, Cl. 364-481.000.
Szczyrbowski, Joachim: *See*—
Dietrich, Anton; Hartig, Klaus; and Szczyrbowski, Joachim, 4,919,778, Cl. 204-192.270.
Szepesi, Tamas S., to National Semiconductor Corporation. Error amplifier for use with parallel operated autonomous current or voltage regulators using transconductance type power amplifiers. 4,920,309, Cl. 323-269.000.
T.K.M. Engineering Kabushiki Kaisha: *See*—
Kume, Takeshi, 4,919,002, Cl. 74-199.000.
T W Kutter Inc.: *See*—
Roach, Kevin V.; Cetiner, M. Selim; Faherty, Vincent E.; and Ventura, Francis P., 4,918,907, Cl. 53-453.000.
Tabak, Samuel A.: *See*—
Harandi, Mohsen N.; Owen, Hartley; and Ta. .k, Samuel A., 4,919,896, Cl. 422-142.000.
Tabata, Toshiyuki; and Ishiyama, Tatsuro, to Nissan Motor Co., Ltd.; and Bridgestone Corporation. Vibration isolator of bushing type with liquid chambers an elastic body. 4,919,400, Cl. 267-140.100.
Tachibana, Megumi: *See*—
Aouda, Yukio; Ninomiya, Hiroshi; Izu, Genichi; Yazawa, Yuichi; and Tachibana, Megumi, 4,919,919, Cl. 424-45.000.
Tacker, Bill D., to Super Sagless Corporation. Safety ottoman. 4,919,478, Cl. 297-85.000.
Tada, Chikashi: *See*—
Yamada, Sumio; Tada, Chikashi; Taoka, Keizo; and Bada, Hajime, 4,919,713, Cl. 75-532.000.
Tada, Hiroaki; Yoshida, Harunobu; Kawahara, Hideo; and Miyata, Kunio, to Nippon Sheet Glass Co., Ltd. Electromagnetic device. 4,919,521, Cl. 350-362.000.
Tagami, Masatoshi: *See*—
Nakakuki, Noboru; Oda, Kazuhide; Tagami, Masatoshi; Okino, Kouichi; Abe, Tomiya; and Ishibashi, Takanobu, 4,919,513, Cl. 350-96.330.
Taggart, George W.; Denk, Lawrence T.; and Lawrence, J. Michael, to Ford, Bacon & Davis Incorporated. Process for the treatment of sulfur containing gases. 4,919,912, Cl. 423-574.00R.
Tainsh, David A.: *See*—
Lovegrove, Claire J.; Rawlins, David A.; Phillips, Anthony J.; and Tainsh, David A., 4,919,938, Cl. 424-480.000.
Taisei Corporation: *See*—
Ebihara, Masaaki; and Nomura, Kyosuke, 4,918,988, Cl. 73-594.000.
Taisei Kako Co., Ltd.: *See*—
Watanabe, Yosuke; Kawakami, Yuji; Kikuchi, Koichiro; Ogawa, Yoshiyuki; and Sato, Hiroshi, 4,919,926, Cl. 424-81.000.
Taiyo Yuden Co., Ltd.: *See*—
Arai, Yuji; Hamada, Emiko; Shin, Yuaki; and Ishiguro, Takashi, 4,920,359, Cl. 346-137.000.
Takagi, Koichi: *See*—
Kawamoto, Yoji; Yuhara, Tetsuo; Takagi, Koichi; and Udagawa, Kanji, 4,919,294, Cl. 220-70.000.
Takagi, Tomoe: *See*—
Yokoe, Masaaki; Takagi, Tomoe; Matsushita, Narihiro; and Takagi, Yuzo, 4,919,062, Cl. 112-121.120.
Takagi, Yuzo: *See*—
Yokoe, Masaaki; Takagi, Tomoe; Matsushita, Narihiro; and Takagi, Yuzo, 4,919,062, Cl. 112-121.120.
Takahara, Kenichi: *See*—
Takahashi, Hiroshi; and Takahara, Kenichi, 4,920,551, Cl. 378-125.000.
Takahashi, Hiroshi; and Takahara, Kenichi, to Kabushiki Kaisha Toshiba. Rotating anode X-ray tube. 4,920,551, Cl. 378-125.000.
Takahashi, Hiroshi: *See*—
Itoh, Hajime; Takahashi, Hiroshi; Ohbori, Kouji; and Habara, Hideaki, 4,919,810, Cl. 210-500.340.
Takahashi, Hiroyuki; Yamamoto, Takashi; and Nakadachi, Takeo, to Murata Manufacturing Co., Ltd. Electronic component having a plate-shaped element. 4,920,296, Cl. 310-348.000.
Takahashi, Ken-ichi: *See*—
Sawada, Hachiro; Fujitsu, Tadashi; Takahashi, Ken-ichi; and Honma, Hideaki, 4,920,504, Cl. 364-521.000.
Takahashi, Kenji; Torii, Takuji; Senshu, Takao; Yamashita, Tetsuji; and Zushi, Shizuo, to Hitachi, Ltd. Falling film evaporator. 4,918,944, Cl. 62-471.000.
Takahashi, Kenkichi: *See*—
Hata, Yasuo; and Takahashi, Kenkichi, 4,919,694, Cl. 55-158.000.
Takahashi, Nobutaka: *See*—
Abo, Toshimi; Satoh, Hiroshi; and Takahashi, Nobutaka, 4,920,494, Cl. 364-431.050.
Takahashi, Noriaki; and Watanabe, Noriko, to Mitsubishi Kasei Corporation. Photopolymerizable composition. 4,920,037, Cl. 430-287.000.
Takahashi, Shinsuke: *See*—
Manaka, Toshio; Shida, Masami; Sekozawa, Teruji; and Takahashi, Shinsuke, 4,919,094, Cl. 123-326.000.
Takahashi, Yasuhiko; Tamura, Kunimitsu; Niimura, Nagato; Asao, Keizo; Honoki, Teruyosi; Masui, Tadaaki; and Ishizaka, Masuo, to Tatsuta Electric Wire and Cable Co., Ltd. Liquid leakage detector line. 4,918,977, Cl. 73-40.50R.
Takahashi, Yoshinobu: *See*—
Fukuta, Kenji; Kaneko, Takaoki; and Takahashi, Yoshinobu, 4,919,745, Cl. 156-345.000.
Takahashi, Yosuke: *See*—
Nishi, Naomi; and Takahashi, Yosuke, 4,919,736, Cl. 148-416.000.
Takalo, Harri: *See*—
Kankare, Jouko; Takalo, Harri; and Paasnen, Paavo, 4,920,195, Cl. 534-16.000.
Takamiya, Hiroshi: *See*—
Sasaki, Yukio; Watanabe, Takayuki; Takamiya, Hiroshi; Watanabe, Kazuo; and Yamazaki, Yoko, 4,920,164, Cl. 523-466.000.
Takamiya, Takeomi: *See*—
Seino, Hitoshi; Kondo, Kensuke; and Takamiya, Takeomi, 4,919,471, Cl. 296-154.000.

Takanashi, Itsuo; Nakagaki, Shintaro; Shinonaga Hirohiko; Asakura, Tautou; and Furuya, Masato, to Victor Company of Japan, Ltd. Photo-to-photo conversion element and its applied system. 4,920,417, Cl. 358-209.000.

Takano, Yasunari; and Okada, Mitsuhiro, to Alps Electric Co., Ltd. A push-button switch with uniform on and off timings. 4,920,245, Cl. 200-533.000.

Takao, Hisashi: *See*—
Imai, Tetsuya; and Takao, Hisashi, 4,920,142, Cl. 514-399.000.

Takao, Mitsunori: *See*—
Ishiguro, Yuji; Hosokawa, Hiroyuki; Koyama, Nobuhiko; Hiramatsu, Eiji; Takao, Mitsunori; Abe, Tomoaki; Kiyono, Masashi; Maeda, Katsuya; and Kamio, Shigeru, 4,919,103, Cl. 123-514.000.

Takashima, Toshiharu: *See*—
Yoshimi, Takani; Matsuura, Akihiro; Takashima, Toshiharu; and Nakano, Hiroyuki, 4,919,575, Cl. 409-231.000.

Takasu, Katsuji; Sano, Masafumi; Tsuda, Hisanori; and Hirai, Yutaka, to Canon Kabushiki Kaisha. Light emitting device. 4,920,387, Cl. 357-17.000.

Takatori Corporation: *See*—
Nakano, Makoto, 4,919,315, Cl. 223-76.000.

Takatori Hitech C., Ltd.: *See*—
Nakano, Makoto, 4,919,315, Cl. 223-76.000.

Takeda Chemical Industries, Ltd.: *See*—
Hanaoka, Tadashi; Kondo, Yoshimi; and Isobe, Ikuo, 4,920,150, Cl. 514-474.000.
Inoue, Keizo; Nomura, Hiroaki; and Imamiya, Eiko, 4,920,134, Cl. 544-316.000.
Kato, Masayasu, 4,920,230, Cl. 546-290.000.

Takeda, Hiromitsu: *See*—
Iyogi, Kiyoshi; Yasumoto, Takaaki; Yanazawa, Toshirou; Iwase, Nobuo; Nakahashi, Masako; and Takeda, Hiromitsu, 4,919,731, Cl. 148-24.000.

Takeda, Masahiro, to NEC Corporation. Recursive digital filter with less no-signal noise. 4,920,507, Cl. 364-724.170.

Takei, Katsumori, to Seiko Epson Corporation, a Japanese Corporation. Imprinting apparatus. 4,920,358, Cl. 346-74.200.

Takei, Tamotsu, to Kabushiki Kaisha Toshiba. Control device for a cooking apparatus which controls a plurality of functions using a single resistance element. 4,920,253, Cl. 219-506.000.

Takesada, Masashi: *See*—
Naruse, Hiroshi; Takesada, Masashi; Hayaishi, Osamu; and Watanabe, Yasuyoshi, 4,920,122, Cl. 514-254.000.

Takeshita, Kaneyoshi; and Matsushita, Takeshi, to Sony Corporation. Semiconductor memory device using diode-capacitor combination. 4,920,513, Cl. 365-175.000.

Takeuchi, Hirosato; Tanaka, Yutaka; Miyazaki, Osahiko; Saito, Noboru; Kubo, Haruo; Kotake, Naoyuki; and Nagumo, Makoto, to Nitto Kohki Co., Ltd. Forging method for a hollow article. 4,918,969, Cl. 72-334.000.

Takeuchi, Kunio: *See*—
Matsukawa, Michimasa; Izumitani, Tetsuro; and Takeuchi, Kunio, 4,919,699, Cl. 65-134.000.

Takiguchi, Yoshihiro: *See*—
Tsuchiya, Yutaka; and Takiguchi, Yoshihiro, 4,920,386, Cl. 356-417.000.

Takikawa, Kazunori; and Ono, Yuichi, to Usui Kokusai Sangyo Kaisha Ltd. Thermosensitive fluidized fan coupling device. 4,919,247, Cl. 192-58.00B.

Tallan, Michael L.: *See*—
Binkley, Joseph H.; Caro, Perry A.; Dillon, John B.; Fay, Charles R.; Gibbons, Jonathan; Hooks, Hilary N.; Kadifa, Abdo G.; Lee, Jeffery W.; Lynch, William C.; Mock, Clayton W.; Neely, Everett T.; Tallan, Michael L.; Thompson, Geoffrey O.; Vukkadala, Gaya; Wick, John D.; and Woods, Donald R., 4,920,481, Cl. 364-200.000.

Tamaki, Shuya: *See*—
Nakama, Yasunari; Harusawa, Fuminori; Otsubo, Kyoko; Iwai, Tsunehiko; Tamaki, Shuya; and Ohkoshi, Masahiro, 4,919,846, Cl. 252-542.000.

Tamashige, Takamiki: *See*—
Fujii, Satoru; Tanaka, Hiroaki; Furukawa, Takeshi; Muraoka, Masaaki; Narishima, Ryosuke; and Tamashige, Takamiki, 4,919,795, Cl. 209-135.000.

Tamura, Kunimitsu: *See*—
Takahashi, Yasuhiko; Tamura, Kunimitsu; Niimura, Nagato; Asao, Keizo; Honoki, Teruyosi; Masui, Tadaaki; and Ishizaka, Masuo, 4,918,977, Cl. 73-40.50R.

Tamura, Yuzo: *See*—
Ogino, Masanori; Kaiwa, Hiroshi; Iwahara, Yoshiaki; Tamura, Yuzo; and Yamamoto, Akio, 4,919,518, Cl. 350-128.000.

Tanaka, Hiroaki: *See*—
Fujii, Satoru; Tanaka, Hiroaki; Furukawa, Takeshi; Muraoka, Masaaki; Narishima, Ryosuke; and Tamashige, Takamiki, 4,919,795, Cl. 209-135.000.

Tanaka, Yuji: *See*—
Chinomi, Isamu; and Tanaka, Yuji, 4,919,486, Cl. 297-443.000.

Tanaka, Yutaka: *See*—
Takeuchi, Hirosato; Tanaka, Yutaka; Miyazaki, Osahiko; Saito, Noboru; Kubo, Haruo; Kotake, Naoyuki; and Nagumo, Makoto, 4,918,969, Cl. 72-334.000.

Tanazawa Hakko Sha Co., Ltd.: *See*—
Koike, Hiroyuki; Hata, Yukihiro; and Sogabe, Mitsuhi, 4,919,388, Cl. 249-115.000.

Tang, Lian X.: *See*—
Vadgama, Pankaj M.; and Tang, Lian X., 4,919,767, Cl. 204-153.100.

Tang, Reginald T.; Mares, Frank; Boyle, William J., Jr.; Chiu, Tin-Ho; and Patel, Kundabhai M., to Allied-Signal Inc. Medical devices fabricated from homopolymers and copolymers having recurring carbonate units. 4,920,203, Cl. 525-409.000.

Tang, Thomas E.: *See*—
Wei, Che-Chia; Tang, Thomas E.; Bohlman, James G.; and Douglas, Monte A., 4,920,073, Cl. 437-200.000.

Taniguchi, Nobuyuki; Ishimura, Toshihiko; Ishikawa, Norio; Seki, Reiji; and Akada, Yasuaki, to Minolta Camera Kabushiki Kaisha. Photo signal processing apparatus. 4,920,370, Cl. 354-402.000.

Tanikawa, Miyoshi: *See*—
Nakagawa, Tadashi; Shinozaki, Nobuo; Koizumi, Hiroyuki; Yamazaki, Hiroshi; Saito, Hiroyuki; Matsushita, Katsuhiko; and Tanikawa, Miyoshi, 4,920,372, Cl. 354-412.000.

Tanimoto, Ichiro: *See*—
Abe, Makoto; Tanimoto, Ichiro; Fujiki, Akira; Suzuki, Keitaro; Endo, Hiroyuki; and Ikenoue, Yutaka, 4,919,719, Cl. 75-243.000.

Tanimoto, Yoshio: *See*—
Yamane, Takakazu; Tanimoto, Yoshio; Nakahama, Tadamitsu; Aizawa, Makoto; and Kishimoto, Tsuneo, 4,919,977, Cl. 427-379.000.

Tanino, Mikio, to Nissan Motor Company, Limited. Control system for air conditioner. 4,919,195, Cl. 165-12.000.

Tanioka, Hiroshi: *See*—
Arahara, Kohzoh; Fukumoto, Hiroshi; Yuasa, Toshiya; Ohnishi, Toshikazu; Kan, Fumitaka, deceased; Tanioka, Hiroshi; Koizumi, Norihiko; and Tohyama, Noboru, 4,920,361, Cl. 346-140.00R.

Tanner, Herbert: *See*—
Spindler, Manfred; and Tanner, Herbert, 4,919,945, Cl. 426-69.000.

Taoka, Keizo: *See*—
Yamada, Sumio; Tada, Chikashi; Taoka, Keizo; and Bada, Hajime, 4,919,713, Cl. 75-532.000.

Tap, Henry H.: *See*—
Bartosiak, George; Sinkovic, Christopher; Tap, Henry H.; Paris, Sam; and Goldberg, Arthur E., 4,919,505, Cl. 350-96.180.

Tapio, Olli: *See*—
Laapotti, Jorma; and Tapio, Olli, 4,919,762, Cl. 162-360.100.

Tashiro, Yasunori; and Suzuki, Yuji, to Rheon Automatic Machinery Co., Ltd. Apparatus for separating and transferring soft cups. 4,919,587, Cl. 414-795.800.

Tatarchuk, Bruce: *See*—
Raythatha, Rasik H.; Tatarchuk, Bruce; and Lee, Woo Y., 4,920,086, Cl. 502-63.000.

Tate & Lyle Public Ltd. Co.: *See*—
Sankey, George H.; and Homer, Nigel J., 4,920,207, Cl. 536-124.000.

Tateishi, Akitaka; Arakawa, Tadao; Kurosawa, Masaru; Kubo, Yoshifumi; and Nagai, Yoji, to Hitachi, Ltd. Heat-and-electricity supply system. 4,920,276, Cl. 290-2.000.

Tatsuta Electric Wire and Cable Co., Ltd.: *See*—
Takahashi, Yasuhiko; Tamura, Kunimitsu; Niimura, Nagato; Asao, Keizo; Honoki, Teruyosi; Masui, Tadaaki; and Ishizaka, Masuo, 4,918,977, Cl. 73-40.50R.

Taylor, Edward C.; Harrington, Philip M.; and Shih, Chuan, to Princeton University, The Trustees of. L-glutamic acid derivatives. 4,920,125, Cl. 514-272.000.

Taylor, Jeffrey L.: *See*—
Goad, Conrad D.; and Taylor, Jeffrey L., 4,919,998, Cl. 428-265.000.

Taylor, Michael D.: *See*—
Hammond, Gary N.; Taylor, Michael D.; and Taylor, Nongnuch, 4,920,536, Cl. 371-10.100.

Taylor, Nongnuch: *See*—
Hammond, Gary N.; Taylor, Michael D.; and Taylor, Nongnuch, 4,920,536, Cl. 371-10.100.

Taylor, Robert W.: *See*—
Gachet, Bentcn W.; Hunstman, Dennis C.; Popik, Matthew G.; and Taylor, Robert W., 4,919,176, Cl. 144-134.00D.

Taylor, William T. Remotely adjustable fishing jar. 4,919,219, Cl. 175-299.000.

TCH Thermo-Consulting-Heidelberg GmbH: *See*—
Mucic, Vinko, 4,918,945, Cl. 62-502.000.

Team, Inc.: *See*—
Owen, Richard A.; and Hannay, Richard C., 4,918,883, Cl. 52-101.000.

Tech/Ops Landauer, Inc.: *See*—
Yoder, Robert C., 4,920,272, Cl. 250-475.200.

Technalytics, Inc.: *See*—
Storace, Anthony, 4,919,320, Cl. 227-19.000.

Technophone Limited: *See*—
Martensson, Nils E. V.; and Ashdown, Michael B., 4,920,352, Cl. 343-702.000.

Teknamed Corporation: *See*—
Brandon, Bobby C., 4,918,839, Cl. 36-7.10R.

Telefonaktiebolaget L M Ericsson: *See*—
Forsberg, Gunnar S.; and Josefsson, Stefan E., 4,920,545, Cl. 375-58.000.

Temperilli, Aldemio: *See*—
Chiodini, Laura; Gobbini, Mauro; Mantegani, Sergio; Ruggieri, Daniela; Temperilli, Aldemio; Traquandi, Gabriella; and Ferrari, Patrizia, 4,920,099, Cl. 514-26.000.

Teng, Nelson N. H.: *See*—
Jones, Lynn A.; Smith, Lloyd H.; and Teng, Nelson N. H., 4,919,889, Cl. 422-40.000.
Terada, Katsumi: *See*—
Hinotani, Katsuhiro; Kishimoto, Shunichi; Kosaka, Haruhisa; Terada, Katsumi; and Hamagishi, Goro, 4,920,298, Cl. 313-493.000.
Terasawa, Koji; Miyakawa, Akira; and Kiyohara, Takehiko, to Canon Kabushiki Kaisha. Liquid ejection recording unit and liquid ejection recording apparatus. 4,920,360, Cl. 346-140.00R.
Terashima, Shigeo: *See*—
Washo, Junichi; Terashima, Shigeo; Deguchi, Toshihisa; Horii, Masahiro; Hyuga, Takao; and Ohta, Kenji, 4,920,437, Cl. 360-99.050.
Terp, Gerald W.; and Stanek, Edward F., to Magna-Graphics Corporation. Web and transfer cutoff apparatus. 4,919,352, Cl. 242-56.00A.
Terumo Kabushiki Kaisha: *See*—
Katsura, Yoshiro, 4,919,802, Cl. 210-188.000.
Kousai, Tadashi; Moriuchi, Yousuke; and Ishida, Toshinobu, 4,919,605, Cl. 425-467.000.
Teshima, Naoto: *See*—
Hayashi, Masahiko; Innami, Yoshiyuki; and Teshima, Naoto, 4,920,328, Cl. 338-21.000.
Tessier, Alain: *See*—
Dufresne, Michel; Sammoun, Samir; Gregory, Dave; Champagne, Jean-Paul; Tessier, Alain; Scott, Pierre; and Methot, Francois, 4,920,533, Cl. 370-85.200.
Tessier, Jean: *See*—
Bonin, Werner; Demoute, Jean-Pierre; and Tessier, Jean, 4,920,231, Cl. 546-300.000.
Testardi, Mark R.: *See*—
Darling, Andrew S.; and Testardi, Mark R., 4,920,537, Cl. 371-5.100.
Texaco Inc.: *See*—
DeBlase, Frank J.; Daly, Daniel T.; Sung, Rodney L.; and Wetherbee, Clifton W., 4,920,058, Cl. 436-85.000.
Herbstman, Sheldon; and Nalesnik, Theodore E., 4,919,685, Cl. 44-62.000.
Nalesnik, Theodore E.; and Herbstman, Sheldon, 4,919,683, Cl. 44-62.000.
Nalesnik, Theodore E.; and Herbstman, Sheldon, 4,919,684, Cl. 44-62.000.
Suggitt, Robert M.; and Najjar, Mitri S., 4,919,688, Cl. 48-69.000.
Texas Aluminum Industries, Inc.: *See*—
Funk, Murrell N., 4,918,882, Cl. 52-86.000.
Texas Instruments Incorporated: *See*—
Elmer, Werner; and Schmitt, Michael, 4,920,283, Cl. 307-443.000.
Kawakami, Masumi, 4,920,393, Cl. 357-23.800.
Keller, Stephen A.; Spry, Piper A.; Adams, Martha S.; and Harper, Ralph G., 4,920,072, Cl. 437-192.000.
Wei, Che-Chia; Tang, Thomas E.; Bohlman, James G.; and Douglas, Monte A., 4,920,073, Cl. 437-200.000.
Wise, Janet L.; and Marum, Steven E., 4,920,286, Cl. 307-542.000.
Textilma AG: *See*—
Speich, Francisco, 4,918,947, Cl. 66-203.000.
TFS, Inc.: *See*—
Smith, Richard W., Jr.; and Smith, Michael E., 4,919,092, Cl. 123-188.00M.
Thaler, Warren: *See*—
Shulik, Larry J.; Sartori, Guido; Ho, W. S. Winston; Thaler, Warren; and Milliman, George E., 4,919,904, Cl. 423-225.000.
Thaler, Warren A.; Brois, Stanley J.; and Hall, Henry K., to Exxon Research and Engineering Company. Sulfonomaleation of organic molecules and polymers. 4,920,179, Cl. 525-285.000.
Theis, Jurgen: *See*—
Coutandin, Jochen; Theis, Jurgen; Groh, Werner; and Herbrechtsmeier, Peter, 4,919,851, Cl. 264-1.500.
Theofanous, Theos E. Diesel engine timing apparatus and method. 4,918,980, Cl. 73-119.00A.
Thermo King Corporation: *See*—
Gustafson, Alan D.; Naley, Lowell B.; Christiansen, David A.; Hoium, Stanley O.; Harrington, Robert L.; Johnson, Dannis R.; and Truckenbrod, Gregory R., 4,918,932, Cl. 62-89.000.
Theuer, Rudolf: *See*—
Nowak, Gerhard; Winter, Alfred; Morbitzer, Hans P.; Theuer, Rudolf; and Kruschik, Klaus, 4,919,448, Cl. 280-618.000.
Tholander, Lars H. G. Yarn storage and feeding device with resilient blocking belt. 4,919,173, Cl. 139-452.000.
Thom, Peter: *See*—
Kallinich, Dietmar; Hahlert, Wolfgang; and Thom, Peter, 4,919,170, Cl. 138-39.000.
Thomas, Alfred, to Kautex Werke Reinold Hagen AG. Process for producing a blow-molded container. 4,919,855, Cl. 264-21.000.
Thomas, John W.: *See*—
Turner, Jerome P.; and Thomas, John W., 4,918,841, Cl. 36-114.000.
Thomas, Michael E., to Fairchild Camera and Instrument Corporation. High temperature interconnect system for an integrated circuit. 4,920,071, Cl. 437-188.000.
Thomas, Richard H.: *See*—
Marschke, Carl R.; Thomas, Richard H.; and Wendorf, William D., 4,919,414, Cl. 271-227.000.
Thomas, William E. Hose clamp tool. 4,919,017, Cl. 81-9.300.
Thomassen & Drijver-Verblifa N.V.: *See*—
Hoekstra, Frans, 4,918,905, Cl. 53-411.000.
Thompson, Geoffrey O.: *See*—
Binkley, Joseph H.; Caro, Perry A.; Dillon, John B.; Fay, Charles R.; Gibbons, Jonathan; Hooks, Hilary N.; Kadifa, Abdo G.; Lee, Jeffery W.; Lynch, William C.; Mock, Clayton W.; Neely, Everett T.; Tallan, Michael L.; Thompson, Geoffrey O.; Vukkadala, Gaya; Wick, John D.; and Woods, Donald R., 4,920,481, Cl. 364-200.000.
Thoms, Eric: *See*—
Samuelson, Hakan; Thoms, Eric; Grauel, Ingolf; Stampe, Werner; and Maurer, Franz, 4,919,492, Cl. 303-3.000.
Thorn EMI plc: *See*—
Scott, Mark A., 4,920,300, Cl. 315-209.00R.
Thoroughbred Plastics Corp.: *See*—
Roof, William M.; Roberts, Eric J.; and Blair, Dennis P., 4,919,285, Cl. 215-230.000.
Thyssen Edelstahlwerke AG: *See*—
Behr, Friedrich, 4,919,863, Cl. 264-42.000.
Thyssen Industrie AG: *See*—
Wcislo, Manfred; Raschbichler, Hans G.; Miller, Luitpold; and Breitenbach, Otto, 4,918,835, Cl. 29-732.000.
Thyssen Stahl AG: *See*—
Meyer, Lutz; Hachtel, Ludwig; and Robusch, Gunter, 4,919,885, Cl. 420-104.000.
Tibbetts, Clark; and Larsen, Pamela L., to Vanderbilt University. Mutated adenovirus E1A gene for E1A promoter stimulation. 4,920,211, Cl. 536-27.000.
Tibbetts, Hubert M.; and Gupta, Mukat, to Tibbetts, Hubert M. Bar shampoo and skin soap. 4,919,838, Cl. 252-117.000.
Tiberg, Lars. Method for transferring water from combustion gases to air of combustion. 4,918,916, Cl. 60-273.000.
Tidwell, Samuel V.: *See*—
Olivier, James P.; Kane, Mary F.; Orr, Clyde, Jr.; Laughinghouse, Charles L.; Wagner, Jack J.; and Tidwell, Samuel V., 4,920,550, Cl. 378-51.000.
Tiedemann, William H.; and Marshall, Dennis L., to Hoover Universal, Inc. Plastic container with ring stabilized base. 4,919,284, Cl. 215-12.100.
Tiefenbach, Lawrence W., Jr., to Dow Chemical Company, The. Method of preparing abrasive articles. 4,918,874, Cl. 51-293.000.
Tiegs, Terry N.; and McDonald, Robert R., to Dow Chemical Company, The. Ductile Ni_3Al alloys as bonding agents for ceramic materials. 4,919,718, Cl. 75-232.000.
Tilden, Thomas J.: *See*—
McGuire, William H.; and Tilden, Thomas J., 4,920,350, Cl. 343-709.000.
Tilman, Menahem: *See*—
Keidar, Itzhak; Dromi, Asher; and Tilman, Menahem, 4,919,427, Cl. 273-155.000.
Timothy, Earle J.; Jackson, Edward W.; Mingrone, Joseph A.; Jolie, Jeffrey W.; Nudelman, Dennis L.; and Howard, John F., to Sherwood Medical Company. Fluid delivery system. 4,919,649, Cl. 604-65.000.
Tingle, Walter J., to General Electric Company. Laminar flow fuel distribution system. 4,918,925, Cl. 60-739.000.
Tioxide Group PLC: *See*—
Chip, Gerald K.; and Rudin, Alfred, 4,920,160, Cl. 523-201.000.
Tischer, John M., to Motorola, Inc. Impedance-compensated thick-film resistor. 4,920,329, Cl. 338-333.000.
Tivattanasuk, Eva: *See*—
Rhodes, Michael L.; Kan, Ada; and Tivattanasuk, Eva, 4,920,573, Cl. 382-6.000.
Tkachev, Valentin N.: *See*—
Yarmashev, Jury N.; Zapandi, Vladimir A.; Tkachev, Valentin N.; and Peder, Olev I., 4,919,641, Cl. 460-69.000.
TMC Corporation: *See*—
Nowak, Gerhard; Winter, Alfred; Morbitzer, Hans P.; Theuer, Rudolf; and Kruschik, Klaus, 4,919,448, Cl. 280-618.000.
Tobias, Charles S. Expandable valise. 4,919,240, Cl. 190-103.000.
Tobita, Chuo; and Matsuno, Eiji, to Amada Company, Limited. Shearing machine. 4,919,028, Cl. 83-153.000.
Tohyama, Noboru: *See*—
Arahara, Kohzoh; Fukumoto, Hiroshi; Yuasa, Toshiya; Ohnishi, Toshikazu; Kan, Fumitaka, deceased; Tanioka, Hiroshi; Koizumi, Norihiko; and Tohyama, Noboru, 4,920,361, Cl. 346-140.00R.
Tokai Corporation: *See*—
Nitta, Tomio, 4,919,610, Cl. 431-274.000.
Tokai Rubber Industries, Ltd.: *See*—
Yano, Katsuhisa, 4,919,401, Cl. 267-140.100.
Tokico Ltd.: *See*—
Kato, Takashi; Morita, Yutaka; Yamaguchi, Takeshi; Tsuge, Kazuo; Imamura, Kyoji; Kawai, Yoshio; Hasegawa, Hiroaki; and Amemori, Hiroyuki, 4,918,996, Cl. 73-861.910.
Tokumasu, Osamu; Kuzuha, Yoshihiro; Suzuki, Hiroshi; and Awata, Bunichiro, to Mitsubishi Denki Kabushiki Kaisha. Laminated iron core assembling process. 4,918,832, Cl. 29-606.000.
Tokunaga, Yukio; and Saeki, Yukio, to Sumitomo Durez Company, Ltd. Color developer for pressure-sensitive recording paper and production thereof using a phenol-xylene-formaldehyde resin. 4,920,185, Cl. 525-506.000.
Tokunaga, Yukio; and Saeki, Yukio, to Sumitomo Durez Company, Ltd. Color developer for pressure sensitive recording paper and production thereof using phenol-mesitylene-formaldehyde resin. 4,920,186, Cl. 525-506.000.

Tokushige, Keizo: *See*—
Morioka, Osamu; Tokushige, Keizo; Kimura, Akeo; and Nihei, Takahiro, 4,918,928, Cl. 62-51.100.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Morita, Shigeru, 4,920,075, Cl. 437-228.000.
Sasaki, Shigeru; and Sakakihara, Hisashi, 4,920,553, Cl. 378-173.000.
Tol, Simon J. M.: *See*—
Wouda, Kornelis J.; and Tol, Simon J. M., 4,920,530, Cl. 370-32.100.
Tomabechi, Hideo: *See*—
Okada, Takao; Nakamura, Takeaki; Nakamura, Kazuo; Nishioka, Kimihiko; Kouchi, Toshihito; Yamamoto, Hiroyuki; and Tomabechi, Hideo, 4,919,520, Cl. 350-331.00T.
Tomatsu, Masahiro: *See*—
Kimura, Takashi; Chihara, Kenichi; Tomatsu, Masahiro; Inoue, Kazunobu; Yano, Norio; and Adachi, Osamu, 4,920,441, Cl. 360-133.000.
Tomcik, James D.: *See*—
Adelmann, Harry W.; and Tomcik, James D., 4,920,534, Cl. 370-94.100.
Tomii, Kaoru; Miyama, Hiroshi; Kawauchi, Yoshikazu; and Nishida, Jun, to Matsushita Electric Industrial Co., Ltd. Drive method for synchronizing scanning and modulation of flat-configuration color CRT. 4,920,410, Cl. 358-67.000.
Tominaga, Shinji; and Hashimoto, Takeshi, to Minolta Camera Kabushiki Kaisha. Device for driving shutter. 4,920,373, Cl. 354-457.000.
Tomioka, Hisashi: *See*—
Uehara, Kenichi; and Tomioka, Hisashi, 4,919,376, Cl. 248-185.000.
Tomita, Yoji: *See*—
Sato, Takesi; Mitsuhashi, Kepichi; Tomita, Yoji; and Sasaki, Yasuoki, 4,918,872, Cl. 51-209.00R.
Tomizawa, Shigechika: *See*—
Horaguchi, Mitsuhiro; Tomizawa, Shigechika; and Kaihara, Yuji, 4,919,905, Cl. 423-239.000.
Toms, Geoffrey S., to General Motors Corporation. Vehicle rear suspension. 4,919,449, Cl. 280-688.000.
Tomy Kogyo Co., Inc.: *See*—
Yoneda, Yousuke; and Furukawa, Masami, 4,919,052, Cl. 104-54.000.
Tone, Junsuke: *See*—
Cullen, Walter P.; Hauske, James R.; Kostek, Gloria J.; Maeda, Hiroshi; and Tone, Junsuke, 4,920,050, Cl. 435-119.000.
Holdom, Kelvin S.; Ruddock, John C.; Tone, Junsuke; Maeda, Hiroshi; and Jefson, Martin R., 4,920,215, Cl. 536-16.800.
Tonka Corporation: *See*—
Ma, Hansan, 4,919,422, Cl. 273-26.00R.
Toray Industries, Inc.: *See*—
Inouye, Yoshinori; Ueda, Minoru; and Yotsuzuka, Kosuke, 4,919,047, Cl. 101-175.000.
Nonaka, Toshihisa; Kobayashi, Keisuke; Igaki, Hiroyuki; and Matsuki, Michiyasu, 4,920,093, Cl. 505-1.000.
Torbert, Walter; Struven, Kenneth C.; Lorenzini, Robert E.; and Bonora, Anthony C., to Siltec Corporation. Floating subcarriers for wafer polishing apparatus. 4,918,870, Cl. 51-131.300.
Torelli, Guido: *See*—
Senderowicz, Daniel; Torelli, Guido; and Nicollini, Germano, 4,920,510, Cl. 364-825.000.
Torenbeek, Reinder: *See*—
Meijer, John; Torenbeek, Reinder; and van den Berg, Rolf H., 4,919,836, Cl. 252-94.000.
Torii, Nobutoshi: *See*—
Toyoda, Kenichi; Mizuno, Toru; Torii, Nobutoshi; Kanda, Yuichi; and Morikawa, Shigehiro, 4,920,248, Cl. 219-124.340.
Torii, Takuji: *See*—
Takahashi, Kenji; Torii, Takuji; Senshu, Takao; Yamashita, Tetsuji; and Zushi, Shizuo, 4,918,944, Cl. 62-471.000.
Torrington Company, The: *See*—
Lawson, James L.; and Harris, David C., 4,919,003, Cl. 74-471.0XY.
Lawson, James L.; and Peterson, Ronald A., 4,919,549, Cl. 384-113.000.
Torti, Anthony: *See*—
Comeau, Paul E.; DeBeau, John M.; and Torti, Anthony, 4,919,185, Cl. 160-178.100.
Toshiba Computer Engineering Corporation: *See*—
Furuya, Akihiko; Kanamaru, Kouiti; and Inoue, Junichi, 4,920,478, Cl. 364-200.000.
Toshimits, Kazushige: *See*—
Noguchi, Kunio; Ueno, Masayuki; and Toshimits, Kazushige, 4,919,101, Cl. 123-493.000.
Totsuka, Mikio; Shinozaki, Fumiaki; Wakata, Yuichi; and Namiki, Tomizo, to Fuji Photo Film Co., Ltd. Photosensitive recording element having pigmented photopolymer layer. 4,920,036, Cl. 430-270.000.
Towohisa, Kunio: *See*—
Isono, Koichi; Towohisa, Kunio; Oka, Junichi; and Sakamoto, Takashi, 4,920,430, Cl. 358-481.000.
Toya, Ichizo; and Yoneyama, Masakazu, to Fuji Photo Film Co., Ltd. Silver halide photosensitive material. 4,920,032, Cl. 430-536.000.
Toyo Seikan Kaisha, Ltd.: *See*—
Asai, Tamio; and Maruhashi, Yoshitsugu, 4,919,985, Cl. 428-36.600.
Maruhashi, Yoshitsugu; Asai, Tamio; Iida, Setsuko; and Hirata, Sadao, 4,919,984, Cl. 428-36.400.
Toyoda Gosei Co., Ltd.: *See*—
Hayashi, Keizo; and Nozaki, Masahiro, 4,918,867, Cl. 49-490.000.
Ohasi, Tamiyosi, 4,919,297, Cl. 220-86.00R.
Toyoda, Kenichi; Mizuno, Toru; Torii, Nobutoshi; Kanda, Yuichi; and Morikawa, Shigehiro, to Fanuc, Ltd. ARC sensing welding apparatus controlled by program. 4,920,248, Cl. 219-124.340.
Toyoda Koki Kabushiki Kaisha: *See*—
Sugita, Kazuhiko; Hotta, Shigeo; Matsuda, Osamu; and Yamakawa, Yoichi, 4,920,572, Cl. 382-48.000.
Yoshimi, Takasi; Matsuura, Akihiro; Takashima, Toshiharu; and Nakano, Hiroyuki, 4,919,575, Cl. 409-231.000.
Toyoshima, Nobuyuki; Shibata, Takanori; and Hirashima, Atsushi, to Menicon Co., Ltd. Highly water-absorptive ocular lens material. 4,920,180, Cl. 525-328.900.
Toyota Jidosha Kabushiki Kaisha: *See*—
Fukuta, Kenji; Kaneko, Takaoki; and Takahashi, Yoshinobu, 4,919,745, Cl. 156-345.000.
Muramatsu, Tadao; and Yamamuro, Shinichi, 4,919,242, Cl. 192-4.00A.
Trachman, Edward G.; Shih, Shan; and Arzoian, John, to Rockwell International Corporation. Transmission apparatus and method. 4,919,010, Cl. 475-281.000.
Trallfa Robot A/S: *See*—
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Tremblet, Jerome: *See*—
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Trent, Warren C. Fluidic flow control. 4,918,935, Cl. 62-93.000.
Trepaud, Pierre. Apparatus for drying gas. 4,919,695, Cl. 55-179.000.
Tresper, Erhard: *See*—
Jakob, Wolfgang; Tresper, Erhard; and Alewelt, Wolfgang, 4,920,201, Cl. 528-486.000.
Trinkl, Gerd: *See*—
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Trivino Vazquez, Fernando; and Clenin, Roger J., to S.A. Societe d'Etudes et d'Applications Industrielles. Method of manufacturing a granular building material from refuse. 4,919,722, Cl. 106-97.000.
Truckenbrod, Gregory R.: *See*—
Gustafson, Alan D.; Naley, Lowell B.; Christiansen, David A.; Hoium, Stanley O.; Harrington, Robert L.; Johnson, Dannis R.; and Truckenbrod, Gregory R., 4,918,932, Cl. 62-89.000.
Trudgeon, Arthur E.: *See*—
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Trumble, William P.; Rosa, Alan D.; and Dick, Kevin H., to Bell Canada. Method and apparatus for inhibiting ice mass formation. 4,918,885, Cl. 52-125.300.
Tsai, Buck S.: *See*—
Wang, Jeff, 4,920,492, Cl. 364-419.000.
Tsai, David M. Remote control animal collar. 4,919,082, Cl. 119-29.000.
Tsao, Hsiang-Wei, to Sun Refining and Marketing Company. Removal of acidic impurities in processes for solvent extraction of aromatics from nonaromatics. 4,919,816, Cl. 210-638.000.
Tsuchimoto, Yuji, to Fujitsu Limited. Read only memory circuit having a precharged selected bit line. 4,920,516, Cl. 365-203.000.
Tsuchiya, Yutaka; and Takiguchi, Yoshihiro, to Hamamatsu Photonics Kabushiki Kaisha. High spatial and time resolution measuring apparatus. 4,920,386, Cl. 356-417.000.
Tsuchiya, Yutaka: *See*—
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Tsuda, Hisanori: *See*—
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Tsuge, Kazuo: *See*—
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Tsujimura, Osamu; Arai, Tatsuo; and Okawa, Masayuki, to Mitsubishi Kinzoku Kabushiki Kaisha. Ball end mill. 4,919,573, Cl. 407-40.000.
Tsukada, Toru, to Nippon Seiko Kabushiki Kaisha. Dust seal for a linear guide apparatus. 4,918,846, Cl. 384-15.000.
Tsukamoto, Masahiro, to Nissan Motor Company, Limited. Actively controlled suspension system for automotive vehicle with fail-safe system in response to failure of electric circuitry. 4,919,440, Cl. 280-707.000.
Tsunoda, Kazuyuki: *See*—
Mori, Toshihiro; and Tsunoda, Kazuyuki, 4,920,353, Cl. 343-702.000.
Tsunoda, Masakazu; Inoue, Akimitsu; and Yamamoto, Tsutomu, deceased (by Yamamoto, Tatsuyo, Hirofumi Yamamoto, Toshifumi Yamamoto, Ikuko Yamamoto, legal representatives), to Nissan Motor Co., Ltd.; and Niles Parts Co., Ltd. Automatic seat positioning device for automotive vehicle and the like. 4,920,338, Cl. 340-825.300.
Tsunoda, Tetsujiro, to Kabushiki Kaisha Toshiba. Manufacturing method for vertically conductive semiconductor devices. 4,920,062, Cl. 437-6.000.

Tsunoda, Tomoaki: *See*—
Sasaki, Ryoichi; Nakamura, Tsutomu; Suzuki, Michio; Shinnai, Kohsuke; Ido, Nobuhiko; and Tsunoda, Tomoaki, 4,920,529, Cl. 370-16.000.
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Tucker, Richard W.: *See*—
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Tulip Slagterierne A.M.B.A.: *See*—
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Turner, De Maris C. Collapsible desk. 4,919,498, Cl. 312-241.000.
Turner, Jerome P.; and Thomas, John W. Athletic shoe with improved midsole. 4,918,841, Cl. 36-114.000.
Turner, William C. Battery terminal seal. 4,920,018, Cl. 429-65.000.
Twilley, Ian C.; and Lofquist, Robert A., to Allied-Signal Inc. Melt-blown water-absorbing tissues and matts. 4,919,997, Cl. 428-227.000.
Twist, Michael; and Platt, Alan, to Hawke Cable Glands Limited. Transit for cables and pipes. 4,919,372, Cl. 248-56.000.
Tyler, Jack D. Apparatus for preventing contact of wet ink sheets with printing press delivery mechanism and for drying said wet ink. 4,919,048, Cl. 101-217.000.
Tyler, Robert A.; Ramsey, Henry C.; and Armstrong, Robert N., to BASF Corporation. Method of preparing cellulosic fibers having increased absorbency. 4,919,681, Cl. 8-116.100.
Tyndale Plains-Hunter Ltd.: *See*—
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U.M.C., Inc.: *See*—
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Ublacker, Peter: *See*—
Laimighofer, Johann; Garnweidner, Peter; Ublacker, Peter; and Luttinger, Johann, 4,919,473, Cl. 296-188.000.
Uchida, Hidetsugu, to Oki Electric Industry Co., Ltd. Semiconductor memory device. 4,920,391, Cl. 357-23.600.
Uchida, Kazuo: *See*—
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Udagawa, Kanji: *See*—
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Yamamoto, Haruhiko; Suzuki, Masahiro; Udagawa, Yoshiaki; Nakata, Mitsuhiko; Katsuyama, Koji; Ono, Izumi; and Kikuchi, Shunichi, 4,920,574, Cl. 361-385.000.
Ueba, Yoshinobu: *See*—
Mizoguchi, Akira; Shioya, Jun; Yamaguchi, Yoichi; and Ueba, Yoshinobu, 4,919,779, Cl. 204-192.310.
Uecker, William F.; Jahnke, Earl M.; and Hughes, Kenneth. Blind operating device and method. 4,919,186, Cl. 160-321.000.
Ueda, Masahide; and Hanada, Yoshihiro, to Minolta Camera Kabushiki Kaisha. Surface potential control device of photoconductive member. 4,920,380, Cl. 355-219.000.
Ueda, Masaru: *See*—
Cho, Hidetsura; and Ueda, Masaru, 4,920,124, Cl. 514-256.000.
Ueda, Minoru: *See*—
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Ueda, Toru: *See*—
Kamiya, Shin; and Ueda, Toru, 4,920,568, Cl. 381-46.000.
Ueda, Tsunehisa; Miyazaki, Kouji; and Natsuume, Tadao, to Nippon Zeon Co., Ltd. Deodorant, deodorizing composite material, deodorizing resin composition, deodorizing resin articles and deodorizing foam. 4,919,925, Cl. 424-76.100.
Uehara, Kenichi; and Tomioka, Hisashi, to Daiwa Manufacturing Co. Ltd. Counter-balancing mechanism for camera universal head. 4,919,376, Cl. 248-185.000.
Ueno, Hideo; Shibata, Satoshi; and Yamada, Keiko, to Brother Kogyo Kabushiki Kaisha. Printer having head release mechanism responsive to space commanding codes. 4,919,553, Cl. 400-120,000.
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Noguchi, Kunio; Ueno, Masayuki; and Toshimits, Kazushige, 4,919,101, Cl. 123-493.000.
Uentech Corporation: *See*—
Bridges, Jack E.; Dubiel, George T.; and Bajzek, Thomas J., 4,919,201, Cl. 166-60.000.
Uhlmann, Fritz, to Bieri Pumpenbau AG. Double-urinal flushing apparatus and method for automatic operation. 4,918,762, Cl. 4-303.000.
Uithoven, Keith: *See*—
McFarland, Edward; Uithoven, Keith; and Carlson, Jeffrey, 4,920,046, Cl. 435-7.000.
Ullman, Myron, to Boardman Molded Products, Inc. Fabric bolt hanger. 4,919,281, Cl. 211-116.000.
Umekawa, Akihiko; and Ishiyama, Yoshihiko, to Ichikoh Industries Ltd. Electrically swingable door mirror. 4,919,526, Cl. 350-604.000.
Unemoto, Yuji, to Kabushiki Kaisha Toshiba. Radio communication apparatus. 4,920,557, Cl. 379-61.000.
Umezawa, Toshimitu, to Kabushiki Kaisha Toshiba. Circuit for separating composite color television signal into luminance signal and chrominance signal. 4,920,408, Cl. 358-31.000.
Unger, Henry M.; and Vorobyov, Michael, to Unger Licencing Ltd. Device for the removal or installation of fluorescent tubes of the single-pin type. 4,919,019, Cl. 81-53.120.
Unger Licencing Ltd.: *See*—
Unger, Henry M.; and Vorobyov, Michael, 4,919,019, Cl. 81-53.120.
Unilever Patent Holdings B.V.: *See*—
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Koleske, Joseph V.; and Osborn, Claiborn L., 4,920,156, Cl. 522-31.000.
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Union Oil Company of California: *See*—
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Uniroyal Chemical Company, Inc.: *See*—
Blem, Allen R.; Plant, Howard L.; and Regis, Richard R., 4,919,703, Cl. 71-86.000.
Cesare, Frank C.; Davis, Robert G.; and Sigworth, William D., 4,919,976, Cl. 427-373.000.
Uniroyal Chemical Ltd/Uniroyal Chemical Ltee: *See*—
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Commerce: *See*—
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Arnone, Gaetano J., 4,920,271, Cl. 250-390.010.
Hobson, David O.; Alexeff, Igor; and Sikka, Vinod K., 4,919,335, Cl. 239-3.000.
Holland, Orin W.; Fathy, Dariush; and White, Clark W., 4,920,076, Cl. 437-238.000.
Weaver, Paul F., 4,919,813, Cl. 210-603.000.
Health and Human Services: *See*—
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Navy: *See*—
Forman, Donald B., 4,919,382, Cl. 248-178.000.
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U.S. Philips Corporation: *See*—
Armstrong, Desmond R., 4,920,321, Cl. 330-257.000.
Brier, Geoffrey; and Rayne, Mark W., 4,920,511, Cl. 364-900.000.
Christiaens, Alois E.; and Lebon, Leon G. G., 4,920,294, Cl. 310-162.000.
den Heijer, Ronald; Goverde, Godefridus C.; and Simons, Peter G. M., 4,920,288, Cl. 310-15.000.
Hartgring, Cornelis D.; Dikken, Jan; and Poorter, Tiemen, 4,920,287, Cl. 307-542.000.
Hermens, Joannes L. G., 4,920,552, Cl. 378-153.000.
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Mateias, Emil, 4,919,157, Cl. 134-2.000.
Remus, Christian; and Chantelou, Olivier, 4,920,414, Cl. 358-133.000.
van der Heijden, Johannes M. A.; Derks, Pierre L. L. M.; and Penning, Cornelis, 4,920,297, Cl. 313-315.000.
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United Technologies Corporation: *See*—
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University of British Columbia: *See*—
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University of Illinois, Board of Trustees of the: *See*—
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Unix Corp.: *See*—
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Unsold, Eberhard: *See*—
Baumgartner, Reinhold; Lenz, Hans; Stepp, Herbert; and Unsold, Eberhard, 4,920,541, Cl. 372-23.000.

Upadhyaya, Shambhu J.; and Demjanenko, Michael, to State University of New York. Method for rendering usuable a defective raw programmable logic array and a defective programmable logic array rendered usable by this method. 4,920,497, Cl. 364-491.000.

Urbach, Hansjorg; Henning, Rainer; and Becker, Reinhard, to Hoechst Aktiengesellschaft. Derivatives of bicyclic amino acids, agents containing them and their use as hypotensives. 4,920,144, Cl. 514-412.000.

Urban, Carl T., to Eastman Kodak Company. Fusing apparatus with self-learning heater. 4,920,250, Cl. 219-216.000.

Urban, John A., to Lucas Industries Public Limited Company. Shoe return spring. 4,919,239, Cl. 188-216.000.

Usinage Montage et Assistance Technique "U.M.A.T." : *See*—
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Usui Kokusai Sangyo Kaisha Ltd.: *See*—
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Vadgama, Pankaj M.; and Tang, Lian X., to Imperial Chemical Industries PLC. Sensor and method for analyte determination. 4,919,767, Cl. 204-153.100.

Vahidsafa, Ali, to Amdahl Corporation. Method and apparatus for arbitration and serialization in a multiprocessor system. 4,920,485, Cl. 364-200.000.

Vail Industries, Inc.: *See*—
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Valdenaire, Jacques, to Martival S.A. Apparatus for gripping frames. 4,919,407, Cl. 269-118.000.

Valentine, Donald, Jr.; and Brown, Duncan W., to American Cyanamid Company. Metalorganic vapor phase epitaxial growth of group II–VI semiconductor materials. 4,920,068, Cl. 437-81.000.

Valeo: *See*—
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Valeo Vision: *See*—
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Van Doorne's Transmissie B.V.: *See*—
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Vanaschen, Luc; Kuster, Hans W.; and Radermacher, Herbert, to Saint-Gobain Vitrage. Process and device for bending glass sheets. 4,918,946, Cl. 65-104.000.

Van Beek, Wilhelmus P.; Den Hoed, Wilma; Van Leeuwen, Willem A.; Poels, Eduard K.; and Visser, Cornelis, to Unilever Patent Holdings B.V. Hydrogenation catalyst. 4,920,089, Cl. 502-335.000.

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Vandenbroucke, Jack: *See*—
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Vandenbroucke, Jack-Eric; and Vandenbroucke, Jack. One-piece stud attachment for supporting non-rigid insulation within a wall structure. 4,918,893, Cl. 52-404.000.

Vanderbilt University: *See*—
Tibbetts, Clark; and Larsen, Pamela L., 4,920,211, Cl. 536-27.000.

Van Der Hardt Aberson, Frederik E. C.; and Van Der Veen, Siebren C., to Van Doorne's Transmissie B.V. Continuously variable transmission with forward and reverse gearing. 4,919,007, Cl. 474-72.000.

van der Heijden, Johannes M. A.; Derks, Pierre L. L. M.; and Penning, Cornelis, to U.S. Philips Corporation. Electric lamp. 4,920,297, Cl. 313-315.000.

Van Der Veen, Siebren C.: *See*—
Van Der Hardt Aberson, Frederik E. C.; and Van Der Veen, Siebren C., 4,919,007, Cl. 474-72.000.

Vandeveld, Paul A. Tennis ball diverter. 4,919,421, Cl. 273-29.00B.

Van Leeuwen, Timothy O.; and Hobbs, Billy J., Jr., to GardenAmerica Corporation. Arc adjustment for irrigation sprinkler. 4,919,337, Cl. 239-205.000.

Van Leeuwen, Willem A.: *See*—
Van Beek, Wilhelmus P.; Den Hoed, Wilma; Van Leeuwen, Willem A.; Poels, Eduard K.; and Visser, Cornelis, 4,920,089, Cl. 502-335.000.

Van Luik, Frank W., Jr.; and Cabahug, Eric F., to Environment/One Corporation. Anti-flooding sewage grinder pump liquid level control system in separately mounted canister. 4,919,343, Cl. 241-36.000.

Vara International, Inc.: *See*—
Vara, Tomas E.; and Anderson, Clyde, 4,919,692, Cl. 55-59.000.

Vara, Tomas E.; and Anderson, Clyde, to Vara International, Inc. Process for removing solvents and other contaminants from an inlet solvent laden air path. 4,919,692, Cl. 55-59.000.

Vareika, Vido J.: *See*—
Cenisio, Marco F.; and Vareika, Vido J., 4,919,724, Cl. 106-199.000.

Varghese, Philip: *See*—
Fischer, Ronald H.; LaPierre, Rene B.; Owens, Peter J.; and Varghese, Philip, 4,919,789, Cl. 208-61.000.

Vasiladiotis, William L.: *See*—
Brodsky, Bruce L.; Davidson, David L.; Hutton, Dwight L.; Vasiladiotis, William L.; and White, Mark D., 4,920,476, Cl. 364-140.000.

Vauhkonen, Vesa: *See*—
Mard, Matti; Vauhkonen, Vesa; and Kangasaho, Olavi, 4,920,306, Cl. 318-722.000.

VAW Vereinigte Aluminium-Werke AG: *See*—
Wilkening, Siegfried, 4,919,771, Cl. 204-67.000.

Veba Kraftwerke Ruhr Aktiengesellschaft: *See*—
Kallinich, Dietmar; Hahlert, Wolfgang; and Thom, Peter, 4,919,170, Cl. 138-39.000.

Venkataraman, Ganapathy; and Froes, Francis H., to United States of America, Air Force. Titanium alloys of the Ti_3Al type. 4,919,886, Cl. 420-420.000.

Ventura, Francis P.: *See*—
Roach, Kevin V.; Cetiner, M. Selim; Faherty, Vincent E.; and Ventura, Francis P., 4,918,907, Cl. 53-453.000.

Vereinigte Edelstahlwerke AG (VEW): *See*—
Kohl, Heinz; Pohl, Helmut; and Puchl, Alois, 4,919,728, Cl. 148-12.00B.

Ver Loren van Themaat, Hendrik M.; and Raath, Pieter L., to Sekerheid En Elektronika Laboratoria. Security barrier with intrusion sesning and delaying means. 4,920,331, Cl. 340-541.000.

Verrecchia, Pascal: *See*—
Elluin, Patrice; Verrecchia, Pascal; Mauer, Georges; and Cardon, Philippe, 4,919,327, Cl. 236-49.100.

Verwaltungsgesellschafft Geiger Plastic GmbH & Co. KG: *See*—
Manner, Walter, 4,919,987, Cl. 428-60.000.

Vescial, Frederick; and Aronowitz, Frederick, to Rockwell International Corporation. Laser accelerometer. 4,918,987, Cl. 73-517.00B.

Vetco Gray Inc.: *See*—
Caulfield, J. Keith; Danner, B. Lee; and Milberger, Lionel J., 4,919,454, Cl. 285-18.000.
Milberger, Lionel J.; and Henderson, Herman O., Jr., 4,919,460, Cl. 285-141.000.

Vetreria Parmense Bormioli Rocco S.p.A.: *See*—
Monti, Roberto L., 4,919,288, Cl. 215-284.000.

Victor Company of Japan, Ltd.: *See*—
Takanashi, Itsuo; Nakagaki, Shintaro; Shinonaga, Hirohiko; Asakura, Tsutou; and Furuya, Masato, 4,920,417, Cl. 358-209.000.

Victor, Kenneth E.; and Goy, Carl A., to MSC Technologies, Inc. Detector system for optical mouse. 4,920,260, Cl. 250-221.000.

Videotron LTEE: *See*—
Dufresne, Michel; Sammoun, Samir; Gregory, Dave; Champagne, Jean-Paul; Tessier, Alain; Scott, Pierre; and Methot, Francois, 4,920,533, Cl. 370-85.200.

Vieira, Walter S. Dust cover for game board. 4,919,426, Cl. 273-148.00R.

Viertl, John R. M., to General Electric Company. Method and apparatus for determining the thickness of a coating on a metal substrate. 4,920,319, Cl. 324-451.000.

View Engineering, Inc.: *See*—
Sacks, Jack; and Weisner, Ralph, 4,920,273, Cl. 250-560.000.

VIFE: *See*—
Chupin, Guillaume; and Dandeville, Denis, 4,918,778, Cl. 15-97.00R.

Vikio, Pentti A., to A. Ahlstrom Corporation. Method and apparatus for grading fiber suspension. 4,919,796, Cl. 209-211.000.

Vilain, Pascal: *See*—
Martinoli, Jean-Luc; Rousseau, Alain; and Vilain, Pascal, 4,918,984, Cl. 73-64.100.

Vinatzer, Alex, to Durst Phototechnik GmbH. Method and a measuring apparatus for determining the exposure time in photographic copying. 4,920,378, Cl. 355-68.000.

Vinoski, Todd. Flushing means for a marine engine. 4,919,800, Cl. 210-94.000.

Virginia Commonwealth University: *See*—
Nestler, John E.; Barlascini, Cornelius O.; Clore, John N.; and Blackard, William G., 4,920,115, Cl. 514-178.000.

Visser, Cornelis: *See*—
Van Beek, Wilhelmus P.; Den Hoed, Wilma; Van Leeuwen, Willem A.; Poels, Eduard K.; and Visser, Cornelis, 4,920,089, Cl. 502-335.000.

Vogel, Christian: *See*—
Moser, Hans; and Vogel, Christian, 4,919,709, Cl. 71-118.000.

Vogelsgesang, Roland: *See*—
Ebert, Wolfgang; Haese, Wilfried; Vogelsgesang, Roland; and Dhein, Rolf, 4,919,514, Cl. 350-96.340.

Vogt, Guenther; Andree, Hans; and Nienhaus, Gertrud, to Henkel Kommanditgesellschaft auf Aktien. Phosphate-free detergent having a reduced tendency towards incrustation. 4,919,845, Cl. 252-526.000.

Volante, Ralph P.: *See*—
Askin, David; Jones, Todd K.; Reamer, Robert A.; Volante, Ralph P.; and Shinkai, Ichiro, 4,920,218, Cl. 540-456.000.

Volker, Wolfgang: *See*—
Donath, Sabine; Grund, Peter; Holz, Peter; Jakobs, Udo; and Volker, Wolfgang, 4,918,876, Cl. 51-426.000.

Volkswagen AG: *See*—
Lissel, Ernst; and Holze, Raimond, 4,920,345, Cl. 342-70.000.

Vollstedt, Thomas J.: *See*—
Copa, William M.; and Vollstedt, Thomas J., 4,919,815, Cl. 210-603.000.

Von Roll Transportsysteme AG: *See*—
Hora, Ferdinand, 4,919,055, Cl. 104-130.000.

von Asselt, Peter A.; and Hordyk, Jan, to Staalkat B.V. Method and an apparatus for sorting and ejecting articles. 4,919,798, Cl. 209-510.000.

von der Heide, Johann: *See*—
Albrecht, Klaus; Hans, Helmut; von der Heide, Johann; and Schmider, Fritz, 4,920,292, Cl. 310-114.000.

Vorobyov, Michael: *See*—
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Vorwerk & Co. Interholding GmbH: *See*—
Pirdzuns, Rolf, 4,920,456, Cl. 361-428.000.

Voss, Gunter, to Leybold Aktiengesellschaft. Method and apparatus for testing fluid-filled systems for leaks. 4,918,975, Cl. 73-40.700.

VSL Corporation: *See*—
Davis, Edgar A.; Watts, Richard L.; and Crigler, John, 4,918,887, Cl. 52-223.00L.

Vu, Phach F. N.: *See*—
Bandurski, Eric L.; Vu, Phach F. N.; and Bruce, Gary D., 4,919,893, Cl. 422-78.000.

Vukkadala, Gaya: *See*—
Binkley, Joseph H.; Caro, Perry A.; Dillon, John B.; Fay, Charles R.; Gibbons, Jonathan; Hooks, Hilary N.; Kadifa, Abdo G.; Lee, Jeffery W.; Lynch, William C.; Mock, Clayton W.; Neely, Everett T.; Talian, Michael L.; Thompson, Geoffrey O.; Vukkadala, Gaya; Wick, John D.; and Woods, Donald R., 4,920,481, Cl. 364-200.000.

W. H. Brady Co.: *See*—
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W. L. Gore & Associates, Inc.: *See*—
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W. R. Grace & Co.-Conn.: *See*—
Wormsbecher, Richard F., 4,920,087, Cl. 502-68.000.

Wacker-Chemie GmbH: *See*—
Innertsberger, Ernst; Schmidlkofer, Jakob; Huber, Peter; Burger, Willibald; and Schulze, Joachim, 4,919,843, Cl. 252-358.000.

Wada, Hiroyuki: *See*—
Kaneda, Naoya; Wada, Hiroyuki; Hirasawa, Mashide; and Suda, Hirofumi, 4,920,369, Cl. 354-400.000.

Wade, Bill R.; and Wade, Thelma L., to Bilou, Inc. Pest collection and disposal device. 4,918,857, Cl. 43-139.000.

Wade, Philip J.: *See*—
Makiyo, Minoru; Goto, Shigenori; Yokosuka, Hiroshi; Curtis, Robert L.; and Wade, Philip J., 4,920,236, Cl. 174-77.00R.

Wade, Thelma L.: *See*—
Wade, Bill R.; and Wade, Thelma L., 4,918,857, Cl. 43-139.000.

Wadel Drippe, L. Kathleen. Recycling wastebasket. 4,919,290, Cl. 220-1.00T.

Wagenknecht, Marcel: *See*—
Jonsson, Ulf; and Wagenknecht, Marcel, 4,919,119, Cl. 606-54.000.

Wagle, Dinkar G.; and Yasnovsky, Vacheslav M., to International Paper Company. Heat treatment of paper products having starch additives. 4,919,758, Cl. 162-175.000.

Wagner, Jack J.: *See*—
Olivier, James P.; Kane, Mary F.; Orr, Clyde, Jr.; Laughinghouse, Charles L.; Wagner, Jack J.; and Tidwell, Samuel V., 4,920,550, Cl. 378-51.000.

Wagner, Paul-Heinz: *See*—
Beuke, Karl, 4,919,018, Cl. 81-57.390.

Wagner, Wilfried, to Alfred Teves GmbH. Valve arrangement. 4,919,168, Cl. 137-627.500.

Wagner, Wolf-Dietrich: *See*—
Bonfert, Helmut; Hardt, Thomas; Klumpp, Rolf; and Wagner, Wolf-Dietrich, 4,919,371, Cl. 248-56.000.

Wahhoud, Adnan: *See*—
Riezler, Rudolf; and Wahhoud, Adnan, 4,919,172, Cl. 139-435.100.

Waible, Leo C., III: *See*—
Pogue, Michael A.; Dempsey, Morgan J.; Shah, Shreyasnsh R.; and Waible, Leo C., III, 4,920,483, Cl. 364-200.000.

Wakata, Yuichi: *See*—
Totsuka, Mikio; Shinozaki, Fumiaki; Wakata, Yuichi; and Namiki, Tomizo, 4,920,036, Cl. 430-270.000.

Wakatake, Koichi, to Nittec Co., Ltd. Automatic analyzer. 4,919,887, Cl. 422-67.000.

Waki, Kokichi; Asami, Masahiro; and Shibata, Yoshinori, to Fuji Photo Film Co., Ltd. Color image forming process comprising developing with substantially no benzyl alcohol a material having specific sensitizing dyes. 4,920,042, Cl. 430-380.000.

Waki, Kouichirou: *See*—
Mitui, Syuzi; Waki, Kouichirou; and Harada, Yasuhiro, 4,919,097, Cl. 123-399.000.

Walden, Donnie T.: *See*—
Pitalo, Stephen K.; Walden, Donnie T.; and Lay, Henry P., 4,919,528, Cl. 350-620.000.

Walker, Richard A.: *See*—
Menard, Alan W.; Suomala, John E.; and Walker, Richard A., 4,919,701, Cl. 65-158.000.

Walker, Robin A., to Dowty Seals Limited. Method of manufacturing a seal. 4,919,969, Cl. 427-58.000.

Walko, Ronald J.: *See*—
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Wallaeys, Bart: *See*—
Monstrey, Joost; and Wallaeys, Bart, 4,920,154, Cl. 521-131.000.

Wallhausser, Karl H.; Hille, Martin; Bucking, Hans-Walter; and Hofinger, Manfred, to Hoechst Aktiengesellschaft. Microbicidal agents based on alkyl-di-guanidinium salts. 4,920,151, Cl. 514-634.000.

Wallis, James: *See*—
Morton, William E.; Fairbanks, Harold V.; Wallis, James; Hunicke, Raymond L.; and Krenicki, Joseph, 4,919,807, Cl. 210-388.000.

Wallner, Frederick: *See*—
Smith, Richard L.; Wallner, Frederick; and Weed, Alvern C., 4,919,632, Cl. 441-44.000.

Walters, Robert E.; and Lederer, David B., to Detection Systems, Inc. Passive infrared detection system with substantially uniform sensitivity over multiple detection zones. 4,920,268, Cl. 250-353.000.

Walz, Alfred, to Dr.-Ing. Luder Gerking. Method for producing superfine powder in spherical form. 4,919,854, Cl. 264-12.000.

Wang, Chen-Shih; Atkins, Richard P.; Eusebi, Elio; and Dearlove, Thomas J., to General Motors Corporation. High strength epoxy tooling compositions. 4,920,161, Cl. 523-220.000.

Wang, Jeff, to Tsai, Buck S., a part interest. Method of inputting chinese characters and keyboard for use with same. 4,920,492, Cl. 364-419.000.

Wang, Shoou-I, to Air Products and Chemicals, Inc. Enhanced heat transfer reformer and method. 4,919,844, Cl. 252-373.000.

Wang, Teh-Chuan, to Du Pont de Nemours, E. I., and Company. Oriented polymeric tape preparation. 4,919,875, Cl. 264-171.000.

Ward, Michael: *See*—
Cotter, Richard; Johnson, Robert C.; Ward, Michael; Madsen, David C.; Valicenti, Anthony J.; Menard, Michael P.; and Tucker, Hugh N., 4,920,098, Cl. 514-2.000.

Ward, N. Robert, Jr., to BioControl Systems, Inc. Process for detection of selected motile organisms. 4,920,063, Cl. 435-7.000.

Ward, Russell C.: *See*—
Forrest, Robin J.; and Ward, Russell C., 4,919,159, Cl. 134-22.180.

Ward, Thomas A.; and Gove, Larry K., to Westinghouse Electric Corp. Resistance welding. 4,920,247, Cl. 219-103.000.

Wardlow, Denis: *See*—
Jackson, James E.; and Wardlow, Denis, 4,919,447, Cl. 280-604.000.

Warkotsch, Horst. Quick-clamping fixture with centering feature for clamping vehicle wheels on the spindle of a balancing machine. 4,918,986, Cl. 73-487.000.

Warland, John R. Filling means. 4,919,174, Cl. 141-384.000.

Warner, Grant H., to Du Pont de Nemours, E. I., and Company. Cut and abrasion resistant spun yarns and fabrics. 4,918,912, Cl. 57-255.000.

Warner-Lambert Company: *See*—
Domagala, John M.; Hagen, Susan E.; and Kiely, John S., 4,920,120, Cl. 514-254.000.

Warnke, Wayne L.: *See*—
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Warrach, Wolfgang; and Reed, Mark S., to Mobay Corporation. Scorch retarder for halogenated elastomers. 4,920,165, Cl. 524-91.000.

Warren, Alan C.: *See*—
Fossum, Eric R.; Kirchner, Peter D.; Pettit, George D.; Warren, Alan C.; and Woodall, Jerry M., 4,920,069, Cl. 437-90.000.

Washo, Junichi; Terashima, Shigeo; Deguchi, Toshihisa; Horii, Masahiro; Hyuga, Takao; and Ohta, Kenji, to Sharp Kabushiki Kaisha. Disc clamping device. 4,920,437, Cl. 360-99.050.

Waske, Herman J.: *See*—
Lesh, Stephen S.; and Waske, Herman J., 4,918,825, Cl. 33-506.000.

Watanabe, Katsuhide: *See*—
Murakami, Chikara; Nakajima, Atsushi; Hiyama, Hirokuni; Inanaga, Satoshi; and Watanabe, Katsuhide, 4,920,290, Cl. 310-90.500.

Watanabe, Kazuhiro: *See*—
Mori, Akio; Watanabe, Kazuhiro; and Mochizuki, Shoichi, 4,918,813, Cl. 29-874.000.

Watanabe, Kazuo: *See*—
Sasaki, Yukio; Watanabe, Takayuki; Takamiya, Hiroshi; Watanabe, Kazuo; and Yamazaki, Yoko, 4,920,164, Cl. 523-466.000.

Watanabe, Noriko: *See*—
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Watanabe, Ryuji; Kosano, Motohiko; and Kawakami, Hirokazu, to Sanyo Electric Co., Ltd. Method for manufacturing a piston. 4,918,806, Cl. 148-16.500.

Watanabe, Takayuki: *See*—
Sasaki, Yukio; Watanabe, Takayuki; Takamiya, Hiroshi; Watanabe, Kazuo; and Yamazaki, Yoko, 4,920,164, Cl. 523-466.000.

Watanabe, Takeo: *See*—
Shida, Takafumi; Arabori, Hideo; Watanabe, Takeo; Kanda, Yohichi; Yamazaki, Shiro; and Shinkawa, Hiroyasu, 4,919,707, Cl. 71-92.000.

Watanabe, Toshiaki; Iguchi, Kazuo; Soejima, Tetsuo; and Ohta, Shinji, to Fujitsu Limited. Demultiplexer system. 4,920,535, Cl. 370-105.100.

Watanabe, Toshiaki: *See*—
Iguchi, Kazuo; Soejima, Tetsuo; Murano, Kazuo; Amemiya, Shigeo; Komine, Hiroaki; Watanabe, Toshiaki; and Shinomiya, Tomohiro, 4,920,546, Cl. 375-106.000.

Watanabe, Yasuyoshi: *See*—
Naruse, Hiroshi; Takesada, Masashi; Hayaishi, Osamu; and Watanabe, Yasuyoshi, 4,920,122, Cl. 514-254.000.

Watanabe, Yoshio; and Emori, Shinji, to Fujitsu Limited. Semiconductor device. 4,920,406, Cl. 357-74.000.

Watanabe, Yosuke; Kawakami, Yuji; Kikuchi, Koichiro; Ogawa, Yoshiyuki; and Sato, Hiroshi, to Ikari Corporation; and Taisei Kako Co., Ltd. Insect attraction preventer. 4,919,926, Cl. 424-81.000.

Wathen, Ronald L.: *See*—
Miller, Steven L.; and Wathen, Ronald L., 4,919,375, Cl. 248-152.000.

Watkins, David W., to BPB Industries Public Limited Company. Method and apparatus for calcination. 4,919,613, Cl. 432-58.000.

Watkins, Frank T., III: *See*—
Weber, Jaroy, Jr.; Kloeckl, Terrance L.; Cast, Michael A.; and Watkins, Frank T., III, 4,919,129, Cl. 606-42.000.

Watkins, Neil A.; Rook, Peter M.; and Woodruff, George. Metal roof panel seamer apparatus. 4,918,797, Cl. 29-243.500.

Watkins, Stephen C.: *See*—
Burlington, Geoffrey M.; and Watkins, Stephen C., 4,919,345, Cl. 241-36.000.

Watson, Lloyd D.: *See*—
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Watts, Richard L.: *See*—
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Wcislo, Manfred; Raschbichler, Hans G.; Miller, Luitpold; and Breitenbach, Otto, to Kabelmetal Electro GmbH; and Thyssen Industrie AG. Apparatus for completing a linear motor stator. 4,918,835, Cl. 29-732.000.

Weaver, Paul F., to United States of America, Energy. Photoenhanced anaerobic digestion of organic acids. 4,919,813, Cl. 210-603.000.

Webasto AG Fahrzeugtechnik: *See*—
Schleicher, Bernd, 4,919,005, Cl. 74-501.600.

Weber, Jaroy, Jr.; Kloeckl, Terrance L.; Cast, Michael A.; and Watkins, Frank T., III, to Celebration Medical Products, Inc. Extendable electrocautery surgery apparatus and method. 4,919,129, Cl. 606-42.000.

Weber, Jurgen: *See*—
Wissmann, Michael; Schleimann, Harald; and Weber, Jurgen, 4,919,091, Cl. 123-179.08G.

Weber, Lawrence H.: *See*—
Martin, M. Warren; and Weber, Lawrence H., 4,919,607, Cl. 425-531.000.

Webre, Jerome B., Jr. Removably attachable noise making lure addition apparatus and method. 4,918,854, Cl. 43-42.310.

Wechner, Edward, to Joy Technologies Inc. Chain conveyor for miner. 4,919,252, Cl. 198-494.000.

Wedel, Gregory L., to Beloit Corporation. Tail cutter apparatus and method. 4,918,836, Cl. 34-23.000.

Weed, Alvern C.: *See*—
Smith, Richard L.; Wallner, Frederick; and Weed, Alvern C., 4,919,632, Cl. 441-44.000.

Wehling, Bernhard; Makowka, Bernd; Klein, Heinz-Gunter, deceased; Klein, Gertrud, heir; and Rosentreter, Helga, to Bayer Aktiengesellschaft. High-extraction chrome tanning process. 4,919,680, Cl. 8-94.270.

Wehrli, Samuel: *See*—
Briner, Emil; and Wehrli, Samuel, 4,918,913, Cl. 57-263.000.

Wei, Che-Chia; Tang, Thomas E.; Bohlman, James G.; and Douglas, Monte A., to Texas Instruments, Incorporated. Selective silicidation process using a titanium nitride protective layer. 4,920,073, Cl. 437-200.000.

Weich, Artur: *See*—
Marx, Juergen; and Weich, Artur, 4,920,365, Cl. 368-242.000.

Weigel, Peter; Holland-Lesz, Guenter; Ademmer, Heinz; and Nottelmann, Ulrich, to Nixdorf Computer AG. Control system for a drawoff system for sheet material. 4,919,412, Cl. 271-110.000.

Weinstein, Richard, to DeVilbiss Company, The. Rotary paint atomizing device. 4,919,333, Cl. 239-223.000.

Weis, Anton: *See*—
Niedermaier, Arnold; and Weis, Anton, 4,919,049, Cl. 101-228.000.

Weise, Lutz: *See*—
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Weishaupt, Walter: *See*—
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Weisner, Ralph: *See*—
Sacks, Jack; and Weisner, Ralph, 4,920,273, Cl. 250-560.000.

Weller, Michael E.: *See*—
Hartmann, Leonard J.; and Weller, Michael E., 4,919,334, Cl. 239-600.000.

Wellinga, Kobus; and Wulder, Rudolf, to Duphar International Research B.V. Insecticidal ureas and thioureas. 4,920,135, Cl. 514-344.000.

Wellons, Fred H., to CBP Resources, Inc. Ruminant animal feed supplement. 4,919,940, Cl. 426-2.000.

Wells, David E. Stable working platform. 4,919,229, Cl. 182-17.000.

Weltzien, Robert F.; and Berlyn, Graeme, to Soilizer Corporation. Fertilizer and/or soil amendment. 4,919,702, Cl. 71-24.000.

Wendling, Peter: *See*—
Obrecht, Werner; Wendling, Peter; Gobel, Wilhelm; and Muller, Eberhard, 4,920,189, Cl. 526-204.000.

Wendorf, William D.: *See*—
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Wenshau, Hugo; and Rice, Grant G., to Intersystems, Inc. Sampler for solid materials. 4,918,999, Cl. 73-863.540.

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Wenstob, Wayne B.; and Wenstob, Kevin J., 4,919,067, Cl. 114-345.000.

Wenstob, Wayne B.; and Wenstob, Kevin J. Self-righting monohull vessel. 4,919,067, Cl. 114-345.000.

Werner & Pfleiderer GmbH: *See*—
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Weschta, Alois: *See*—
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Wessel, Erich: *See*—
Ehluss, Heinz-Gunter; Wessel, Erich; and Oldach, Uwe, 4,919,064, Cl. 114-150.000.

West, Henry L.; and Kozelsky, Joseph D. Modular assistive listening system. 4,920,570, Cl. 381-68.000.

Western Digital Corp.: *See*—
Friend, Robert C.; and Patton, Charles R., III, 4,920,339, Cl. 340-825.520.

Western, Edward D.: *See*—
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Westinghouse Electric Corp.: *See*—
Aul, Raymond J.; Howell, Robert L.; and Ramsey, Lawrence W., 4,919,882, Cl. 376-293.000.
Brodsky, Bruce L.; Davidson, David L.; Hutton, Dwight L.; Vasiladiotis, William L.; and White, Mark D., 4,920,476, Cl. 364-140.000.
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Bucher, George D.; DiGrande, John T.; Frye, Lester C.; and Stoutamire, Mark S., 4,918,991, Cl. 73-864.000.
Gaussa, Louis W., Jr.; Graham, Kingsley F.; Lipchak, John B.; and Greenberg, Lesley, 4,920,548, Cl. 376-255.000.
Hankinson, Michael F.; Swidwa, Kenneth J.; and Salton, Robert B., 4,919,881, Cl. 376-260.000.
Pavlik, Dennis; and Nathenson, Richard D., 4,919,192, Cl. 164-502.000.
Seidensticker, Raymond G.; Kochka, Edgar L.; and Duncan, Charles S., 4,919,901, Cl. 422-249.000.
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Westvaco Corporation: *See*—
Lafler, Robert E., 4,919,044, Cl. 101-141.000.

Wetherbee, Clifton W.: *See*—
DeBlase, Frank J.; Daly, Daniel T.; Sung, Rodney L.; and Wetherbee, Clifton W., 4,920,058, Cl. 436-85.000.

Weyerhaeuser Company: *See*—
Johnson, Donald C.; and Neogi, Amar N., 4,919,753, Cl. 162-116.000.

Wheeler, Stanley P., Jr.: *See*—
Hutton, Alexander E., Jr.; Burke, Richard E.; and Wheeler, Stanley P., Jr., 4,920,171, Cl. 524-446.000.

Whight, Kenneth R., to U.S. Philips Corporation. Method of manufacturing an insulated gate field effect transistor DMOS. 4,920,064, Cl. 437-41.000.

Whitcomb, Melville T. Satellite attitude control. 4,919,367, Cl. 244-164.000.

White, Clark W.: *See*—
Holland, Orin W.; Fathy, Dariush; and White, Clark W., 4,920,076, Cl. 437-238.000.

White, Dean: *See*—
Paschke, Robert A.; Mosel, James A.; Kratsch, Charles H.; White, Dean; and Edinger, Travis H., 4,918,878, Cl. 52-28.000.

White, Mark D.: *See*—
Brodsky, Bruce L.; Davidson, David L.; Hutton, Dwight L.; Vasiladiotis, William L.; and White, Mark D., 4,920,476, Cl. 364-140.000.

White, Nikki O.: *See*—
Hartline, Michael F.; and White, Nikki O., 4,918,770, Cl. 5-13.000.

Whitehead, Martin J.: *See*—
Deuring, Hans; Maquire, James H.; Worsley, Clifford R.; and Whitehead, Martin J., 4,919,090, Cl. 123-90.670.

Whitenack, Joan E.; Sanchez, George; Stone, Earlyn W.; and Colton, Buddy A., to Acry Industries, Incorporated. Compact, efficient, easy-to-clean food steamer for home use, with safety features and versatile modular food compartment. 4,920,251, Cl. 219-401.000.

Whittaker, Neil; and Boulanger, Denis, to Canadian Patents and Development Limited/Societe Canadienne Des Brevets Et D'Exploitation Limitee. High power RF switch. 4,920,324, Cl. 333-106.000.

Wick, John D.: *See*—
Binkley, Joseph H.; Caro, Perry A.; Dillon, John B.; Fay, Charles R.; Gibbons, Jonathan; Hooks, Hilary N.; Kadifa, Abdo G.; Lee, Jeffery W.; Lynch, William C.; Mock, Clayton W.; Neely, Everett T.; Tallan, Michael L.; Thompson, Geoffrey O.; Vukkadala, Gaya; Wick, John D.; and Woods, Donald R., 4,920,481, Cl. 364-200.000.

Widmann, James C. Renewable aromatic cedar block. 4,918,871, Cl. 51-181.00R.

Wiese, Harold. Telescopic flagpole. 4,918,896, Cl. 52-632.000.

Wiley, Nathaniel C., Jr., to Airshield Corporation. Rooftop drag reducing device for multi-truck shipment when mounted. 4,919,472, Cl. 296-180.200.

Wilhelm, Volker; and Mansmann, Manfred, to Bayer Aktiengesellschaft. Rutile mixed phase pigments with improved coloristic properties. 4,919,723, Cl. 106-441.000.

Wilhelm, Volker: *See*—
Rademachers, Jakob; and Wilhelm, Volker, 4,919,726, Cl. 106-428.000.
Wilkening, Siegfried, to VAW Vereinigte Aluminium-Werke AG. Process for producing aluminum by molten salt electrolysis. 4,919,771, Cl. 204-67.000.
Wilkes, Peter R.; Scarlett, John; and Harrison, George E., to Davy McKee (London) Limited. Process for the purification of tetrahydrofuran. 4,919,765, Cl. 203-64.000.
Will, Norbert: *See*—
Schweikert, Wilhelm; Will, Norbert; and Lauer, Wilhelm, 4,920,457, Cl. 361-530.000.
Willcoxen, Mark A.: *See*—
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Willer, Rodney L.: *See*—
Biddle, Richard A.; and Willer, Rodney L., 4,919,737, Cl. 149-19.500.
Willert, Hans B.: *See*—
Buchhorn, Ursula; and Willert, Hans B., 4,919,666, Cl. 623-16.000.
Willert, Hans-Georg; and Semlitsch, Manfred, to Sulzer Brothers Limited. Prosthesis for a femoral head. 4,919,673, Cl. 623-23.000.
Willett, Mark A.; and McCarthy, James P., to GKN Automotive, Inc. Viscous differential. 4,919,006, Cl. 74-650.000.
Willey, Monroe J.; and Evert, Daniel D., to Kraft General Foods, Inc. Microwave carton. 4,919,785, Cl. 206-625.000.
Wm. Wrigley Jr. Company: *See*—
Zibell, Steven E., 4,919,941, Cl. 426-5.000.
Williams, Clarence O.: *See*—
Olive, Billy B.; and Williams, Clarence O., 4,918,856, Cl. 43-113.000.
Williams, Gregg G., to Williams International Corporation. Balanced ring seal. 4,919,439, Cl. 277-27.000.
Williams International Corporation: *See*—
Williams, Gregg G., 4,919,439, Cl. 277-27.000.
Williams, James E., to Xerox Corporation. Photoreceptor edge erase system for tri-level xerography. 4,920,024, Cl. 430-45.000.
Williams, James M. Process for reestablishing circulation in a lost return zone. 4,919,218, Cl. 175-72.000.
Williams, Jeffrey L.: *See*—
Bougher, Jerry D.; Anthony, James R.; Williams, Jeffrey L.; Homeier, Ronald F.; and Lortz, Allan R., 4,919,484, Cl. 297-474.000.
Williamson, Lee H.: *See*—
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Willrett, Douglas L.; and Comotto, Michael, to Nordica International, Inc. Method of manufacturing cheese. 4,919,942, Cl. 426-38.000.
Wilsch, Herbert: *See*—
Huber, Leonhard; Nagel, Erich; Payrhammer, Bernd; Lermann, Peter; Treiber, Helmut; and Wilsch, Herbert, 4,919,354, Cl. 242-67.30R.
Wilson, Jim. Finishing tool. 4,919,604, Cl. 425-458.000.
Wilson, Mark E.: *See*—
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Win Lighter Corporation: *See*—
Ohsawa, Jiro, 4,919,111, Cl. 126-25.00B.
Windle, Anthony B. Planting apparatus. 4,919,059, Cl. 111-105.000.
Windley, William T., to Du Pont de Nemours, E. I., and Company. Process for preparing a nylon fiber with reduced spherulites. 4,919,874, Cl. 264-168.000.
Winger, James W. Quick release railroad highway crossing. 4,919,330, Cl. 238-8.000.
Winkler, Matthias; Ittemann, Peter; and Matthies, Hans G., to BASF Aktiengesellschaft. Production of fiber composites. 4,919,978, Cl. 427-381.000.
Winston, Anthony E.: *See*—
Kurtz, Andrew D.; and Winston, Anthony E., 4,919,910, Cl. 423-422.000.
Winter, Alfred: *See*—
Nowak, Gerhard; Winter, Alfred; Morbitzer, Hans P.; Theuer, Rudolf; and Kruschik, Klaus, 4,919,448, Cl. 280-618.000.
Wisdom, Leonard A., to Miles Inc. Blood bag system with integral filtering means. 4,919,823, Cl. 210-749.000.
Wise, Janet L.; and Marum, Steven E., to Texas Instruments Incorporated. Method and circuitry for compensating for negative internal ground voltage glitches. 4,920,286, Cl. 307-542.000.
Wiser-Halladay, Robin, to Atlantic Richfield Company. Polyurethane quasi prepolymer for proppant consolidation. 4,920,192, Cl. 528-48.000.
Wisniewski, Joseph M.: *See*—
Benoit, Fredrick C.; Cardenas, Ruben; Schmid, Daniel; and Wisniewski, Joseph M., 4,918,886, Cl. 52-221.000.
Wissmann, Michael; Schleimann, Harald; and Weber, Jurgen, to Andreas Stihl. Ignition switch arrangement for an internal combustion engine having an electrical ignition system. 4,919,091, Cl. 123-179.0BG.
Wittenzelliner, Siegfried. Process for disposing of waste. 4,919,569, Cl. 405-128.000.
Wittingslow, Desmond T., Jr. Hand skill amusement game. 4,919,429, Cl. 273-1.0GG.
Woditsch, Peter: *See*—
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Woessner, Michael A.: *See*—
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Wojnarowski, Robert J.: *See*—
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Wolf, Anthony D.: *See*—
Hay, James V.; and Wolf, Anthony D., 4,919,706, Cl. 71-90.000.
Wolf, Jay W. Shooting and training aid for basketball players. 4,919,425, Cl. 273-1.50A.
Wolfel, Herbert: *See*—
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Wolfrum, Johannes: *See*—
Krappitz, Heinz; Wolfel, Herbert; and Wolfrum, Johannes, 4,919,589, Cl. 414-798.900.
Wolsiefer, Harald: *See*—
Deegener, Elmar; Wolsiefer, Harald; and Cremer, Heinz P., 4,919,488, Cl. 297-468.000.
Wong, Keith K. Telephone with built-in emergency panic switch, long distance toll timer and music on hold cards. 4,920,556, Cl. 379-51.000.
Wong, Kwok-Ping, to Otis Engineering Corporation. Union for pipe or tree with metal and resilient seals. 4,919,456, Cl. 285-39.000.
Wong, Lam F., to Xerox Corporation. Swing arm roller speed differential web tracking system. 4,919,318, Cl. 226-17.000.
Wong, Stephen S.: *See*—
Chen, Nai Y.; Garwood, William E.; Huang, Tracy J.; Le, Quang N.; and Wong, Stephen S., 4,919,788, Cl. 208-59.000.
Wood, Kevin L.: *See*—
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Woodall, Jerry M.: *See*—
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Woodard, Kenneth E., Jr.: *See*—
Miles, Ronald C.; Justice, David D.; and Woodard, Kenneth E., Jr., 4,919,791, Cl. 204-98.000.
Woodruff, David W.; and Redwing, Joan M., to General Electric Company. Articles having coatings of fine-grained and/or equiaxed grain structure. 4,920,012, Cl. 428-634.000.
Woodruff, George: *See*—
Watkins, Neil A.; Rook, Peter M.; and Woodruff, George, 4,918,797, Cl. 29-243.500.
Woodruff, James R., to Sundstrand Data Control, Inc. Flexures and method for creating flexures in a wafer. 4,919,993, Cl. 428-134.000.
Woodruff, William: *See*—
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Woods, Donald R.: *See*—
Binkley, Joseph H.; Caro, Perry A.; Dillon, John B.; Fay, Charles R.; Gibbons, Jonathan; Hooks, Hilary N.; Kadifa, Abdo G.; Lee, Jeffery W.; Lynch, William C.; Mock, Clayton W.; Neely, Everett T.; Tallan, Michael L.; Thompson, Geoffrey O.; Vukkadala, Gaya; Wick, John D.; and Woods, Donald R., 4,920,481, Cl. 364-200.000.
Woods, Woodrow E. Liquid cooled exhaust flange. 4,918,917, Cl. 60-320.000.
Woody, Clark M.: *See*—
Smith, David A.; and Woody, Clark M., 4,919,415, Cl. 271-284.000.
Woollenweber, William E.; and Beck, Niels J. Internal combustion engine turbosystem and method. 4,918,923, Cl. 60-597.000.
Wormsbecher, Richard F., to W. R. Grace & Co.-Conn. Vanadium scavenging compositions. 4,920,087, Cl. 502-68.000.
Worrell, Dean A.: *See*—
Kyrtsos, Christos T.; and Worrell, Dean A., 4,919,222, Cl. 177-139.000.
Worsley, Clifford R.: *See*—
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Worthington, William: *See*—
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Wouda, Kornelis J.; and Tol, Simon J. M., to AT&T and Philips Telecommunications B.V. Adaptive time-discrete filter for forming a cancelling signal from synchronous data symbols. 4,920,530, Cl. 370-32.100.
Wright, Andrew C. W. Receptacle for quick-release fastener. 4,919,580, Cl. 411-173.000.
Wright, E. Scott; and Kenehan, James G., to Allied-Signal Inc. Composite member, unitary rotor member including same, and method of making. 4,919,594, Cl. 416-230.000.
Wright, James W.; and Holley, John M., Jr., to Mead Corporation, The. Multiple compartment container. 4,919,269, Cl. 206-602.000.
Wright, Terrance M.: *See*—
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Wroblewski, Thomas R., to Chrysler Corporation. Electrical device command system, single wire bus and smart single controller arrangement therefor. 4,920,532, Cl. 370-85.100.
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Binkley, Joseph H.; Caro, Perry A.; Dillon, John B.; Fay, Charles R.; Gibbons, Jonathan; Hooks, Hilary N.; Kadifa, Abdo G.; Lee, Jeffery W.; Lynch, William C.; Mock, Clayton W.; Neely, Everett T.; Tallan, Michael L.; Thompson, Geoffrey O.; Vukkadala, Gaya; Wick, John D.; and Woods, Donald R., 4,920,481, Cl. 364-200.000.

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Sweatman, Gerald H.; Hodgson, Roy; and Haste, Robert H., 4,920,025, Cl. 430-128.000.

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Yablonovitch, Eli: *See*—
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Yafuso, Masao; Hui, Henry K.; Yan, Cheng F.; and Miller, William W., to Minnesota Mining and Manufacturing Company. Sensor with overcoating and process for making same. 4,919,891, Cl. 422-58.000.

Yagihara, Morio: *See*—
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Yamada, Masanori, to Canon Kabushiki Kaisha. Image processing apparatus which selectably outputs image information. 4,920,502, Cl. 364-518.000.

Yamada, Sumio; Tada, Chikashi; Taoka, Keizo; and Bada, Hajime, to Kawasaki Steel Corp. Process for producing chromium containing molten iron. 4,919,713, Cl. 75-532.000.

Yamada, Takuma: *See*—
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Yamagishi, Kooji, to Casio Computer Co., Ltd. Matrix type color liquid crystal display device. 4,920,409, Cl. 358-56.000.

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Yamamoto, Akio: *See*—
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Yamamoto, Haruhiko; Suzuki, Masahiro; Udagawa, Yoshiaki; Nakata, Mitsuhiko; Katsuyama, Koji; Ono, Izumi; and Kikuchi, Shunichi, to Fujitsu Limited. Cooling system for an electronic circuit device. 4,920,574, Cl. 361-385.000.

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Yamamoto, Takemi: *See*—
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Yamamoto, Takuya; Fushimi, Fumiyoshi; and Nishikido, Jyoji, to Asahi Kasei Kogyo Kabushiki Kaisha. Hollow fiber membrane. 4,919,809, Cl. 210-500.230.

Yamamoto, Tatsuyo, Hirofumi Yamamoto, Toshifumi Yamamoto, Ikuko Yamamoto, legal representatives: *See*—
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Yamamoto, Tsutomu, deceased: *See*—
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Yamato, Yoshiro, to Shimano Industrial Company Limited. Fixture for a fishing reel. 4,918,852, Cl. 43-22.000.

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Yamauchi, Hiroyuki; Yamada, Toshio; and Inoue, Michihiro, to Matsushita Electric Industrial Co., Ltd. Semiconductor memory device having sub bit lines. 4,920,517, Cl. 365-207.000.

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Yamazaki, Shohei, to Yamaha Corporation. Magnetic recording and reproducing device with improved track servo. 4,920,435, Cl. 360-77.150.

Yamazaki, Shumpei; Sato, Masashiko; and Sakayori, Hiroyuki, to Semiconductor Energy Laboratory Co., Ltd. Liquid crystal device with a ferroelectric film and method for manufacturing the same. 4,919,633, Cl. 445-24.000.

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Yang, Choong-Jin; and Ray, Ranjan, to Kubota Ltd. Iron-neodymium-boron permanent magnet alloys which contain dispersed phases and have been prepared using a rapid solidification process. 4,919,732, Cl. 148-103.000.

Yang, Shin K. Tire pump with a pressure gage. 4,919,600, Cl. 417-63.000.

Yang, Shu S.: *See*—
Chang, Michael N.; Chiang, Yuan-Ching P.; Heck, James V.; Lewis, Michael D.; and Yang, Shu S., 4,920,106, Cl. 514-63.000.

Yano, Katsuhisa, to Tokai Rubber Industries, Ltd. Fluid-filled bushing having radially displaceable intermediate sleeve coated with sealing rubber layer. 4,919,401, Cl. 267-140.100.

Yano, Norio: *See*—
Kimura, Takashi; Chihara, Kenichi; Tomatsu, Masahiro; Inoue, Kazunobu; Yano, Norio; and Adachi, Osamu, 4,920,441, Cl. 360-133.000.

Yao, Kenji: *See*—
Shinohara, Toshiro; Mihara, Teruyoshi; and Yao, Kenji, 4,920,396, Cl. 357-42.000.

Yarmashev, Jury N.; Zapandi, Vladimir A.; Tkachev, Valentin N.; and Peder, Olev I., to Spetsializirovannoe Konstruktorskoe Bjuro No Komplexam Machin Dlya Dvukhfaznoi Uborki. Axial threshing and separating means. 4,919,641, Cl. 460-69.000.

Yarrow, Paul I. W.: *See*—
Lambie, Ian A.; Yarrow, Paul I. W.; Langley, Robert; and Campbell, Colin D., 4,920,217, Cl. 540-135.000.

Yasnovsky, Vacheslav M.: *See*—
Wagle, Dinkar G.; and Yasnovsky, Vacheslav M., 4,919,758, Cl. 162-175.000.

Yassaie, Mohamad H.; King-Smith, Anthony D.; and Dyson, Clive M., to Inmos Limited. Multistage digital signal multiplication and addition. 4,920,508, Cl. 364-736.000.

Yasuda, Masahiro. Hair clip. 4,919,155, Cl. 132-278.000.

Yasumoto, Takaaki: *See*—
Iyogi, Kiyoshi; Yasumoto, Takaaki; Yanazawa, Toshirou; Iwase, Nobuo; Nakahashi, Masako; and Takeda, Hiromitsu, 4,919,731, Cl. 148-24.000.

Yasuno, Yoshiki: *See*—
Higashimata, Akira; and Yasuno, Yoshiki, 4,919,494, Cl. 303-100.000.

Yazaki Corporation: *See*—
Mori, Akio; Watanabe, Kazuhiro; and Mochizuki, Shoichi, 4,918,813, Cl. 29-874.000.

Yazawa, Yuichi: *See*—
Aouda, Yukio; Ninomiya, Hiroshi; Izu, Genichi; Yazawa, Yuichi; and Tachibana, Megumi, 4,919,919, Cl. 424-45.000.

Yee, Jeng-Jung; and Narasimhan, Rajagopalan, to Schreiber Foods, Inc. Pasta filata-type cheese process. 4,919,943, Cl. 426-39.000.

Yen, Junling J.: *See*—
Mauger, Philip E.; Shimkunas, Alex R.; and Yen, Junling J., 4,919,749, Cl. 156-643.000.

Yetman, David S., to EG&G, Inc. Electrophorresis cassette spacer. 4,919,784, Cl. 204-299.00R.

Yi-Yan, Alfredo: *See*—
Colas, Etienne G.; and Yi-Yan, Alfredo, 4,919,504, Cl. 350-96.120.

Yoder, Robert C., to Tech/Ops Landauer, Inc. Detector for radon. 4,920,272, Cl. 250-475.200.

Yokoe, Masaaki; Takagi, Tomoe; Matsushita, Narihiro; and Takagi, Yuzo, to Brother Kogyo Kabushiki Kaisha. Data processor for use in sewing machine. 4,919,062, Cl. 112-121.120.

Yokosuka, Hiroshi: *See*—
Makiyo, Minoru; Goto, Shigesori; Yokosuka, Hiroshi; Curtis, Robert L.; and Wade, Philip J., 4,920,236, Cl. 174-77.00R.

Yokoyama, Kiyoshi: *See*—
Yoshida, Makoto; Sato, Masahiro; Koga, Kazunori; Osamura, Kazumi; Kousaka, Shoji; Maeda, Tatsumi; Yokoyama, Kiyoshi; and Matsunaka, Masafumi, 4,920,085, Cl. 501-97.000.

Yokoyama, Nobuyoshi, to Paloma Kogyo Kabushiki Kaisha. Gas cooking appliance. 4,919,110, Cl. 126-394.000.

Yokozuka, Tsuchiyasu, to Yamasu Co., Ltd. Mechanism for opening and closing mercury sphygmomanometer. 4,919,142, Cl. 128-684.000.

Yoneda, Yousuke; and Furukawa, Masami, to Tomy Kogyo Co., Inc. Track apparatus for a toy racing car. 4,919,052, Cl. 104-54.000.

Yoneeyama, Minoru, to Yonex Kabushiki Kaisha. Tennis racket. 4,919,438, Cl. 273-73.00C.

Yonex Kabushiki Kaisha: *See*—
Yoneeyama, Minoru, 4,919,438, Cl. 273-73.00C.

Yoneyama, Masakazu: *See*—
Toya, Ichizo; and Yoneyama, Masakazu, 4,920,032, Cl. 430-536.000.

York, Merineth S. Fletching tool. 4,919,405, Cl. 269-38.000.

Yoshida, Harunobu: *See*—
Tada, Hiroaki; Yoshida, Harunobu; Kawahara, Hideo; and Miyata, Kunio, 4,919,521, Cl. 350-362.000.

Yoshida, Makoto; Sato, Masahiro; Koga, Kazunori; Osamura, Kazumi; Kousaka, Shoji; Maeda, Tatsumi; Yokoyama, Kiyoshi; and Matsunaka, Masafumi, to Kyocera Corporation. Silicon nitride sintered body and process for preparation thereof. 4,920,085, Cl. 501-97.000.

Yoshie, Tsuyoshi, to Kabushiki Kaisha Toshiba. Method and system for interpolation-processing delay time data. 4,920,521, Cl. 367-103.000.

Yoshikawa, Satonobu. Electrostatic flocking device. 4,919,070, Cl. 118-621.000.

Yoshimi, Takasi; Matsuura, Akihiro; Takashima, Toshiharu; and Nakano, Hiroyuki, to Toyoda Koki Kabushiki Kaisha. Apparatus for compensating for the thermal displacement of the main spindle of a machine tool. 4,919,575, Cl. 409-231.000.

Yoshino, Tatsuo, to Fuji Photo Film Co., Ltd. Temperature control method for distributing power to a plurality of heating elements. 4,920,252, Cl. 219-497.000.

Yoshino, Yukihiko: *See*—
Okubo, Toshimitsu; Kobayashi, Kazuyoshi; Ohmura, Kohki; Sai, Yoshinobu; Satoh, Takuo; Yoshino, Yukihiko; Hoshi, Nobuyuki; Onodera, Takayuki; Endoh, Yasuo; Irokawa, Sigenobu; and Sannohe, Toshiaki, 4,919,045, Cl. 101-142.000.

Yoshio, Junichi, to Pioneer Electronic Corporation. Digital audio signal playback system delay. 4,920,569, Cl. 381-61.000.

Yoshio, Shintani; and Mikio, Inatsu, to Hitachi, Ltd.; and Hitachi Microcomputer Engineering Ltd. Semiconductor MIS integrated circuit device. 4,920,398, Cl. 357-42.000.

Yoshiro, Nakamura, to O.N. Industries Co., Ltd. Joint mechanism for thin-wall stainless steel pipe. 4,919,455, Cl. 285-23.000.

Yotsuzuka, Kosuke: *See*—
Isouye, Yoshinori; Ueda, Minoru; and Yotsuzuka, Kosuke, 4,919,047, Cl. 101-175.000.

Young, David C.; and Willcoxen, Mark A., to Adolph Coors Company. Pressure generation system for a container. 4,919,310, Cl. 222-386.500.

Young, James V.: *See*—
Muchisky, Thomas P.; and Young, James V., 4,919,117, Cl. 128-62.00R.

Young, Michael E.; Edwards, David M.; and Lyons, Robin; S., to Creative Design and Packaging Cardiff Limited. Containers. 4,919,268, Cl. 206-509.000.

Youngblood, Terry D.: *See*—
Jackson, Jerry D.; and Youngblood, Terry D., 4,919,123, Cl. 126-110.00R.

Youssef, Nabil N. Method and apparatus for planting seeds and growing plants. 4,918,863, Cl. 47-85.000.

Youssefyeh, Raymond D.: *See*—
Pelletier, Jeffrey C.; Youssefyeh, Raymond D.; and Campbell, Henry F., 4,920,219, Cl. 540-523.000.
Pelletier, Jeffrey C.; Youssefyeh, Raymond D.; and Campbell, Henry F., 4,920,227, Cl. 546-133.000.

Yu, Che-Fn, to GTE Laboratories Incorporated. Distributed security procedure for intelligent networks. 4,919,545, Cl. 380-25.000.

Yuasa, Toshiya: *See*—
Arahara, Kohzoh; Fukumoto, Hiroshi; Yuasa, Toshiya; Ohnishi, Toshikazu; Kan, Fumitaka, deceased; Tanioka, Hiroshi; Koizumi, Norihiko; and Tohyama, Noboru, 4,920,361, Cl. 346-140.00R.

Yuge, Tadashi, to Alps Electric Co., Ltd. Push button switch device with illuminating means. 4,920,243, Cl. 200-314.000.

Yuhara, Tetsuo: *See*—
Kawamoto, Yoji; Yuhara, Tetsuo; Takagi, Koichi; and Udagawa, Kanji, 4,919,294, Cl. 220-70.000.

Yukami, Noboru; Ikeda, Mitsusuke; Ohno, Masaharu; and Nisihtani, Mikihiko, to Matsushita Electric Industrial Co., Ltd. Photo-sensing device with S-shaped response curve. 4,920,394, Cl. 357-30.000.

Yuza, Yasutada: *See*—
Arikawa, Hiroo; and Yuza, Yasutada, 4,920,327, Cl. 337-231.000.

Zabrocki, Karl; Lindner, Christian; Koch, Otto; and Braese, Hans-Eberhard, to Bayer Aktiengesellschaft. Seeded emulsion polymerization of α-methylstyrene and acrylonitrile. 4,920,178, Cl. 525-262.000.

Zahedi, Bijan. Carpet fastener. 4,918,782, Cl. 16-11.000.

Zapandi, Vladimir A.: *See*—
Yarmashev, Jury N.; Zapandi, Vladimir A.; Tkachev, Valentin N.; and Peder, Olev I., 4,919,641, Cl. 460-69.000.

Zarnowski, Alfred J.: *See*—
Averill, Robert G.; Zarnowski, Alfred J.; and Lyons, Matthew V., 4,919,679, Cl. 623-23.000.

Zatkulak, Tony D.; Rodini, David J.; and Hodge, James D., to Du Pont de Nemours, E. I., and Company. Apparatus for and process of treating shrinkable fibers. 4,919,869, Cl. 264-78.000.

Zebco, Corporation: *See*—
Roberts, Dennis E., 4,919,360, Cl. 242-260.000.

Zeigler, Henry J.; and Frisinger, Bruce L., to Martin Marietta. Rivetless nut plate and fastener. 4,919,578, Cl. 411-113.000.

Zellen, Wendy: *See*—
Sadaranganey, Gobind T.; Zellen, Wendy; and Michaelides, John, 4,919,952, Cl. 426-254.000.

Zeller, Gary P.: *See*—
Savage, Russell C.; Zeller, Gary P.; and Skirha, Martin D., 4,919,876, Cl. 264-258.000.

Zelman, Allen, to Rensselaer Polytechnic Insitute. Membrane pouch. 4,920,105, Cl. 514-59.000.

Zenith Electronics Corporation: *See*—
Konopka, John G., 4,920,302, Cl. 315-307.000.

Zibell, Steven E., to Wm. Wrigley Jr. Company. Chewing gum containing delayed release protein sweetener and method. 4,919,941, Cl. 426-5.000.

Ziegler, George M., Jr.: *See*—
Kadan, Ranjit S.; and Ziegler, George M., Jr., 4,919,958, Cl. 426-573.000.

Ziek, Robert: *See*—
Holston, Sylvester; Ziek, Robert; and Woodruff, William, 4,918,903, Cl. 53-471.000.

Zier, Horst D.; Kerner, Wolfgang; and Pfeiffer, Ernst F., to Institute fur Diabetestechnologie Gemeinnutzige Forschungs- und Entwicklungs-

gesellschaft mbH. Implantable electrochemical sensor. 4,919,141, Cl. 128-635.000.

Zimpro/Passavant Inc.: *See*—
Copa, William M.; and Vollstedt, Thomas J., 4,919,815, Cl. 210-603.000.

Zink, Thomas: *See*—
Handke, Heinz; Zink, Thomas; and Soegioltzis, Vasilios, 4,919,967, Cl. 427-8.000.

Zinser Textilmaschinen GmbH: *See*—
Grau, Gerhard; and Derichs, Josef, 4,918,911, Cl. 57-100.000.

Zirco, Inc.: *See*—
Clements, Philip E., 4,920,470, Cl. 363-21.000.

Zorb, James E.: *See*—
Ball, W. Kenneth; Goulait, David J. K.; and Zorb, James E., 4,919,738, Cl. 156-73.500.

Zupancic, Joseph J.: *See*—
Swedo, Raymond J.; and Zupancic, Joseph J., 4,919,808, Cl. 210-490.000.

Zurlippe, Clemens F.: *See*—
Manning, Jeffrey L.; and Zurlippe, Clemens F., 4,918,963, Cl. 72-199.000.

Zushi, Shizuo: *See*—
Takahashi, Kenji; Torii, Takuji; Senshu, Takao; Yamashita, Tetsuji; and Zushi, Shizuo, 4,918,944, Cl. 62-471.000.

Zweymuller, K.; and Koch, Rudolf, to Sulzer Brothers Limited. Metal shell for an artificial hip joint socket. 4,919,676, Cl. 623-22.000.

378134 Alberta Ltd.: *See*—
Kehler, Garry, 4,919,443, Cl. 280-304.100.

501 Mitsubishi Paper Mills Limited: *See*—
Ohashi, Minoru; and Horii, Shoichi, 4,920,043, Cl. 430-611.000.

780863 Ontario Limited: *See*—
Smith, James W.; Barton, Robert A.; and Knight, Cyril H., deceased, 4,919,914, Cl. 423-376.200.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 24TH DAY OF APRIL, 1990

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Atlas Powder Company: *See*—
Janoski, Florian B., Re. 33,202, Cl. 102-202.300.

Blake, Frederick H., to Multipoint Control Systems, Inc. Linear analog light-level monitoring system having short leads to reduce electronic noise. Re. 33,205, Cl. 250-214.0AL.

Froom, Thomas W., to Rolph-Clark-Stone Packaging Corporation. Carton for packaging ice cream or like frozen initially liquid or semi-solid material. Re. 33,204, Cl. 206-626.000.

Janoski, Florian B., to Atlas Powder Company. Energy transmission device. Re. 33,202, Cl. 102-202.300.

Multipoint Control Systems, Inc.: *See*—
Blake, Frederick H., Re. 33,205, Cl. 250-214.0AL.

Reimers, Eric W. Golf bag device. Re. 33,203, Cl. 206-315.500.

Rolph-Clark-Stone Packaging Corporation: *See*—
Froom, Thomas W., Re. 33,204, Cl. 206-626.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

J. S. Popper Inc.: *See*—
Popper, Robert H., Jr., B1 4,254,929, Cl. 248-447.000.

Popper, Robert H., Jr., to J. S. Popper Inc. Apparatus for enabling movement of a binder. B1 4,254,929, 4-24-90, Cl. 248-447.000.

Seeley, Edward H.: *See*—
Seeley, Larry E.; and Seeley, Edward H., B1 3,942,680, Cl. 220-324.000.

Seeley, Larry E.; and Seeley, Edward H. Spray paint container and attachment therefor. B1 3,942,680, 4-24-90, Cl. 220-324.000.

LIST OF DESIGN PATENTEES

Abe, Yoshinori; Inoue, Muneaki; and Hata, Kazuhiro, to Mitsubishi Denki Kabushiki Kaisha. Programmable controller. 307,416, 4-24-90, Cl. D13-164.000.

Abel, Donald J. Rosary. 307,501, 4-24-90, Cl. D99-26.000.

Adachi, Koushiro; Shibuya, Shinji; Tsukaguchi, Tamotsu; and Miyamoto, Mitsuo, to Hitachi, Ltd. Central processor unit. 307,420, 4-24-90, Cl. D14-102.000.

Akagi, Kenichi: *See*—
Tedham, Thomas A.; and Akagi, Kenichi, 307,421, Cl. D14-114.000.

Akard, W. Stephen. Peg board sign holder. 307,448, 4-24-90, Cl. D20-43.000.

Alberti, Alberto: *See*—
Guelfi, Giorgio; Villa, Ezio; Mendicino, Franco; Pasquali, Renato; and Alberti, Alberto, 307,404, Cl. D12-92.000.

Alfa Lancia Industriale S.r.l.: *See*—
Guelfi, Giorgio; Villa, Ezio; Mendicino, Franco; Pasquali, Renato; and Alberti, Alberto, 307,404, Cl. D12-92.000.

Allied Plastics, Inc.: *See*—
Page, Cornelius D., Jr., 307,355, Cl. D3-40.000.

Amerex Corporation: *See*—
Goodnight, Fred B., 307,494, Cl. D29-5.000.

Anthes Industries, Inc.: *See*—
Brasil, John G., 307,480, Cl. D25-68.000.

Armstrong, Eric J.; Eldon, James B.; and Lamond, Lee T., to Checkpoint Systems, Inc. Electronic article surveillance antenna structure. 307,400, 4-24-90, Cl. D10-106.000.

Art Leather Manufacturing Co.: *See*—
Roberts, Mark H., 307,357, Cl. D6-301.000.

Asahi, Sadaho, to Yoshida Kogyo K. K. Pull tab of slider for slide fastener. 307,403, 4-24-90, Cl. D11-221.000.

Aschauer, Joseph G.; and Cuccio, John, to TIE Communications, Inc. Telephone base. 307,418, 4-24-90, Cl. D14-151.000.

Asea AB: *See*—
Holmer, Anders; Pettersson, Owe; Tornros, Mats; and Maddock, Peter, 307,415, Cl. D13-164.000.

Asics Corporation: *See*—
Kayano, Toshikazu, 307,351, Cl. D2-320.000.

Astra Meditec Aktiebolag: *See*—
Soderberg, Per O., 307,472, Cl. D24-16.000.

Avnet, Inc.: *See*—
Stagl, Peter M., 307,481, Cl. D25-122.000.
Stagl, Peter M., 307,482, Cl. D25-122.000.
Stagl, Peter M., 307,483, Cl. D25-122.000.

Aylsworth, Richard W. Can holder. 307,372, 4-24-90, Cl. D7-622.000.

Bailey, Bob; and Stucker, Jeffrey L., to Racemark International, Inc., a part interest. Partial seat cover for use in vehicles. 307,370, 4-24-90, Cl. D6-611.000.

Banchi, Andrew: *See*—
Thieroff, Alan J., Jr.; Kaplan, Larry T.; and Banchi, Andrew, 307,490, Cl. D28-7.000.

Basen, Donald: *See*—
Rouse, Raymond R., Jr.; and Basen, Donald, 307,402, Cl. D11-157.000.

Bearak, Harold. Wine bottle holder. 307,373, 4-24-90, Cl. D7-616.000.

Bennett, Richard; Evans, Steven B.; and Davis, Damon A., to Daris Design Company. Security door. 307,479, 4-24-90, Cl. D25-48.000.

Blair, Graham J., to Lever Brothers Company. Bottle body. 307,391, 4-24-90, Cl. D9-376.000.

BMR Investments, Inc.: *See*—
Larson, Raymond L., 307,389, Cl. D9-370.000.

Bold, Alfred J.: *See*—
Payack, Robert A.; and Bold, Alfred J., 307,434, Cl. D15-10.000.

Bombardier Inc.: *See*—
Lapointe, Denys, 307,414, Cl. D12-307.000.

Bomkamp, Fred A. Scalp massager. 307,475, 4-24-90, Cl. D24-36.000.

Boone, David D., to Lynx Golf, Inc. Golf club putter head. 307,455, 4-24-90, Cl. D21-219.000.

Booth, Alfred E., Jr., to Products by DesignAir, Inc. Air freshener dispenser. 307,468, 4-24-90, Cl. D23-366.000.

Borst, Rodney D., to Hoechst Celanese Corporation. Food receptacle. 307,395, 4-24-90, Cl. D9-428.000.

Bott, John A. Wind deflector. 307,409, 4-24-90, Cl. D12-181.000.

Bott, John A. Wind deflector. 307,410, 4-24-90, Cl. D12-181.000.

Bott, John A. Wind deflector. 307,411, 4-24-90, Cl. D12-181.000.

Box, Thomas, to Spectrum International, Inc. Beverage case. 307,499, 4-24-90, Cl. D34-43.000.

Bradford, Rodney; and Brantley, Lott W. Inflatable, reflective solar evaporator. 307,460, 4-24-90, Cl. D23-207.000.

Bradley, David L., to Quality Components, Inc. Combined vehicle fender and running board unit. 307,413, 4-24-90, Cl. D12-203.000.

Brantley, Lott W.: *See*—
Bradford, Rodney; and Brantley, Lott W., 307,460, Cl. D23-207.000.

Brasil, John G., to Anthes Industries, Inc. Spacer element for scaffolding. 307,480, 4-24-90, Cl. D25-68.000.

British Telecommunications public limited company: *See*—
Desbarats, Guy E., 307,430, Cl. D14-151.000.
Brown, Paul D.; and Ringel, Judith, to Reebok International Ltd. Shoe upper. 307,350, 4-24-90, Cl. D2-314.000.
Burns, Mark T.: *See*—
Dry, James R.; and Burns, Mark T., 307,365, Cl. D6-429.000.
Bycraft, John T.: *See*—
Pomeroy, Charles; and Bycraft, John T., 307,361, Cl. D6-347.000.
Pomeroy, Charles; and Bycraft, John T., 307,362, Cl. D6-347.000.
Pomeroy, Charles; and Bycraft, John T., 307,363, Cl. D6-347.000.
Canon Kabushiki Kaisha: *See*—
Doi, Susumu, 307,439, Cl. D18-13.000.
Endo, Aiko; and Hasegawa, Koh, 307,436, Cl. D18-12.000.
Omino, Seiichi; Endo, Aiko; and Watanabe, Katsuhiro, 307,440, Cl. D18-13.000.
CertainTeed Corporation: *See*—
Westphal, Dennis; and Piles, Jonathan, 307,484, Cl. D25-124.000.
Westphal, Dennis; and Piles, Jonathan, 307,485, Cl. D25-124.000.
Westphal, Dennis; and Piles, Jonathan, 307,486, Cl. D25-124.000.
Checkpoint Systems, Inc.: *See*—
Armstrong, Eric J.; Eldon, James B.; and Lamond, Lee T., 307,400, Cl. D10-106.000.
Cheng, Peter S. C. Flat toothpick dispenser card. 307,493, 4-24-90, Cl. D28-64.000.
Collister, Kenneth D., to Miles Inc. Reflectance meter. 307,399, 4-24-90, Cl. D10-46.000.
Conrad, George R., to General Electric Company. Fluid container. 307,393, 4-24-90, Cl. D9-376.000.
Cook, June C. Syringe shield. 307,474, 4-24-90, Cl. D24-25.000.
Cooper, William K. Combined book mark and template. 307,442, 4-24-90, Cl. D19-34.000.
Corrie, Alexander S. Fishing hand caster. 307,457, 4-24-90, Cl. D22-137.000.
Costa, Jorge, to Hermes Precisa International SA. Ribbon cassette for a typewriter or the like. 307,437, 4-24-90, Cl. D18-12.000.
Cuccio, John: *See*—
Aschauer, Joseph G.; and Cuccio, John, 307,418, Cl. D14-151.000.
Daiwa Seiko, Inc.: *See*—
Iinuma, Kanji, 307,458, Cl. D22-141.000.
Kameda, Yasuhisa, 307,459, Cl. D22-141.000.
D'Alessandro, Sandy R. Snow plow. 307,378, 4-24-90, Cl. D8-10.000.
Daris Design Company: *See*—
Bennett, Richard; Evans, Steven B.; and Davis, Damon A., 307,479, Cl. D25-48.000.
Davis, Damon A.: *See*—
Bennett, Richard; Evans, Steven B.; and Davis, Damon A., 307,479, Cl. D25-48.000.
Desbarats, Guy E., to British Telecommunications public limited company. Telephone base unit. 307,430, 4-24-90, Cl. D14-151.000.
DIA Chemical Co., Ltd.: *See*—
Watanabe, Tadao, 307,489, Cl. D28-5.000.
Divnick International, Inc.: *See*—
Divnick, Stevan M., 307,503, Cl. D99-34.000.
Divnick, Stevan M., to Divnick International, Inc. Coin collector. 307,503, 4-24-90, Cl. D99-34.000.
Doi, Susumu, to Canon Kabushiki Kaisha. Printer. 307,439, 4-24-90, Cl. D18-13.000.
Dolco Packaging Corporation: *See*—
Payne, Joe R.; and Magoffin, Kenneth A., 307,387, Cl. D9-341.000.
Donnie, Andre; and Oliver, Linda M. Protective cover for a tie. 307,352, 4-24-90, Cl. D2-609.000.
D'Orlando, Michael. Dough forming and cutting device. 307,371, 4-24-90, Cl. D7-677.000.
Doyel, John S. Magnet pick-up. 307,417, 4-24-90, Cl. D13-183.000.
Driscoll, James C. Portable weight exerciser. 307,454, 4-24-90, Cl. D21-196.000.
Dry, James R.; and Burns, Mark T. Fish cleaning table. 307,365, 4-24-90, Cl. D6-429.000.
Eld, Raynold A., to Eld, Raynold A. Slingshot frame. 307,456, 4-24-90, Cl. D22-106.000.
Eldon Industries, Inc.: *See*—
Evenson, Mel, 307,447, Cl. D20-10.000.
Eldon, James B.: *See*—
Armstrong, Eric J.; Eldon, James B.; and Lamond, Lee T., 307,400, Cl. D10-106.000.
Electro-Matic Staplers, Inc.: *See*—
Knispel, Barry, 307,379, Cl. D8-14.100.
Endo, Aiko; and Hasegawa, Koh, to Canon Kabushiki Kaisha. Ink ribbon cassette for electronic typewriter. 307,436, 4-24-90, Cl. D18-12.000.
Endo, Aiko: *See*—
Omino, Seiichi; Endo, Aiko; and Watanabe, Katsuhiro, 307,440, Cl. D18-13.000.
Englund, Tord, to Sandvik AB. Handle for bow saw. 307,382, 4-24-90, Cl. D8-97.000.
Evans, Steven B.: *See*—
Bennett, Richard; Evans, Steven B.; and Davis, Damon A., 307,479, Cl. D25-48.000.
Evenson, Mel, to Eldon Industries, Inc. Sign. 307,447, 4-24-90, Cl. D20-10.000.
Ex-Design Corporation: *See*—
Kawasaki, Kazuo, 307,376, Cl. D7-652.000.
Ficken, Leonard A., to Unidynamics Corporation. Vending machine for foods. 307,446, 4-24-90, Cl. D20-4.000.
Fushiya, Fusao; and Tozawa, Katsumi, to Makita Electric Works, Ltd. Electric sprayer. 307,463, 4-24-90, Cl. D23-225.000.
Garden Way Incorporated: *See*—
Payack, Robert A.; and Bold, Alfred J., 307,434, Cl. D15-10.000.
General Electric Company: *See*—
Conrad, George R., 307,393, Cl. D9-376.000.
Noe, Raymond J., 307,487, Cl. D26-2.000.
Gertson, Carmel L. Free standing portable adjustable mirror. 307,358, 4-24-90, Cl. D6-302.000.
Giallourakis, Michael A., to Sponge Fishing Co., Inc. Chamois and pile covered sponge. 307,497, 4-24-90, Cl. D32-40.000.
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Gonzalez, Vivian; and Trujillo, Rebeca. Baby bottle. 307,477, 4-24-90, Cl. D24-47.000.
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Goodnight, Fred B., to Amerex Corporation. Fire extinguisher mounting bracket. 307,494, 4-24-90, Cl. D29-5.000.
Greatwood, Yvonne L. Crutch pad or the like. 307,353, 4-24-90, Cl. D3-10.000.
Greenhut, Steven E.; and Goodman, Sheldon. Combined writing pad and pencil holder. 307,445, 4-24-90, Cl. D19-78.000.
Guelfi, Giorgio; Villa, Ezio; Mendicino, Franco; Pasquali, Renato; and Alberti, Alberto, to Alfa Lancia Industriale S.r.l. Automotive vehicle. 307,404, 4-24-90, Cl. D12-92.000.
Gutkowski, Ronald R., to S. C. Johnson & Son, Inc. Air freshener. 307,469, 4-24-90, Cl. D23-367.000.
Ham, Young H., to Goldstar Co., Ltd. Cassette tape recorder. 307,431, 4-24-90, Cl. D14-165.000.
Hannula, Donald L., to Johnson & Johnson Consumer Products, Inc. Dental pliers shield. 307,473, 4-24-90, Cl. D24-16.000.
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Hoshino, Kiyoshi: *See*—
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Huang, Jung-Hua. Saw handle. 307,383, 4-24-90, Cl. D8-97.000.
Iinuma, Kanji, to Daiwa Seiko, Inc. Reel for fishing. 307,458, 4-24-90, Cl. D22-141.000.
Ilaria, Peter V.; and Macowski, William, to Tropar Manufacturing Co., Inc. Combined clock and wall plaque. 307,396, 4-24-90, Cl. D10-24.000.
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Jimena, Carlos L. Stapler. 307,380, 4-24-90, Cl. D8-61.000.
Joerger, Gerhard E. Faucet handle. 307,464, 4-24-90, Cl. D23-251.000.
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Kaiser, Elmar, Jr. Vehicle hood ornament. 307,412, 4-24-90, Cl. D12-198.000.
Kameda, Yasuhisa, to Daiwa Seiko, Inc. Reel for fishing. 307,459, 4-24-90, Cl. D22-141.000.
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Kawasaki, Kazuo, to Ex-Design Corporation. Knife. 307,376, 4-24-90, Cl. D7-652.000.
Kayano, Toshikazu, to Asics Corporation. Shoe sole. 307,351, 4-24-90, Cl. D2-320.000.
Kim, Byoung D. Engine oil filter for a motor vehicle. 307,461, 4-24-90, Cl. D23-209.000.
Kimura, Kinichi. Collapsible beverage container. 307,385, 4-24-90, Cl. D9-302.000.
Kirkpatrick, Hugh J.; Lee, Thomas J.; and Lee, James M. Dry wall cutter. 307,381, 4-24-90, Cl. D8-95.000.
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Knispel, Barry, to Electro-Matic Staplers, Inc. Glue gun. 307,379, 4-24-90, Cl. D8-14.100.
Knotter, David G.; and Numbers, Jody L. Case. 307,354, 4-24-90, Cl. D3-30.100.
Kodama, Hidetoshi, to Seikosha Co., Ltd. Ink ribbon cassette for an electronic computer. 307,438, 4-24-90, Cl. D18-12.000.
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Larson, Raymond L., to BMR Investments, Inc. Bottle. 307,389, 4-24-90, Cl. D9-370.000.
Laubscher, Donald J., to Hicks, Delbert W. Toy puzzle. 307,452, 4-24-90, Cl. D21-107.000.
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Lowman, Darrell G., to Lane Company, The. Sofa. 307,364, 4-24-90, Cl. D6-381.000.
Lubcke, Kip C. Shellfish opening tool. 307,374, 4-24-90, Cl. D7-695.000.
Lubcke, Kip C. Shellfish opening tool. 307,375, 4-24-90, Cl. D7-695.000.
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McAllister, Joseph D. Combined clothes hanger and handle. 307,360, 4-24-90, Cl. D6-318.000.
McKeehan, Paul B. Game board or similar article. 307,449, 4-24-90, Cl. D21-34.000.
McKeehan, Paul B. Game board or similar article. 307,450, 4-24-90, Cl. D21-35.000.
McKeehan, Paul B. Game board or similar article. 307,451, 4-24-90, Cl. D21-35.000.
Mednis, Juris M., to Universal Symetrics Corporation. Bottle. 307,390, 4-24-90, Cl. D9-375.000.
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Merkouris, Christ S. Grease filter for use in restaurants or the like. 307,462, 4-24-90, Cl. D23-209.000.
Merritt, Kenneth R. Combined soap and tooth brush holder. 307,366, 4-24-90, Cl. D6-529.000.
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Mullaly, Scott. Tool tray. 307,500, 4-24-90, Cl. D34-45.000.
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Pfeifer, Herbert; Montgomery, Paul; and Sturges, Dan, to Samsung Electronics Co., Ltd. Handset and stand telecommunication instrument. 307,429, 4-24-90, Cl. D14-151.000.
Phillips, Charles M. Ladder hook. 307,384, 4-24-90, Cl. D8-373.000.
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Poisson, Norman D.; Searle, Scott G.; Warren, Robert D.; Kapec, Jeffrey; and Tanaka, Kazuna, to Gillette Company, The. Grip portion for a writing instrument. 307,444, 4-24-90, Cl. D19-55.000.

Polhemus, Marlan H., to NEC Home Electronics U.S.A. Inc. Telephone set. 307,427, 4-24-90, Cl. D14-151.000.

Pomeroy, Charles; and Bycraft, John T., to Jack-Post Corporation. Glider. 307,361, 4-24-90, Cl. D6-347.000.

Pomeroy, Charles; and Bycraft, John T., to Jack-Post Corporation. Glider. 307,362, 4-24-90, Cl. D6-347.000.

Pomeroy, Charles; and Bycraft, John T., to Jack-Post Corporation. Glider. 307,363, 4-24-90, Cl. D6-347.000.

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Provins, Paul. Storage and display unit for game board and pieces. 307,367, 4-24-90, Cl. D6-552.000.

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Roberts, Mark H. Framing mat for a photo or the like. 307,356, 4-24-90, Cl. D6-301.000.

Roberts, Mark H., to Art Leather Manufacturing Co. Framing mat for a photo or the like. 307,357, 4-24-90, Cl. D6-301.000.

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Rouse, Raymond R., Jr.; and Basen, Donald. Combined lawn ornament and sprinkler. 307,402, 4-24-90, Cl. D11-157.000.

Russel, Charles A., to Tangible Concepts, Inc. Fractional block set. 307,453, 4-24-90, Cl. D21-108.000.

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Shim, Jae J., to Gold Star Co., Ltd. Video cassette recorder. 307,425, 4-24-90, Cl. D14-135.000.

Shimano, Kenji; Yamazaki, Shusuke; and Katagami, Yoshinori, to Kabushiki Kaisha Toshiba. Air conditioner. 307,467, 4-24-90, Cl. D23-351.000.

Silcox, Charles E. Combined confectionery tray, advertising holder and donation box. 307,504, 4-24-90, Cl. D99-36.000.

Soderberg, Per O., to Astra Meditec Aktiebolog. Drill-mountable tool for the installation and removal of threaded dental prosthetic elements. 307,472, 4-24-90, Cl. D24-16.000.

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Stagl, Peter M., to Avnet, Inc. Decorative extrusion. 307,482, 4-24-90, Cl. D25-122.000.

Stagl, Peter M., to Avnet, Inc. Decorative extrusion. 307,483, 4-24-90, Cl. D25-122.000.

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Tedham, Thomas A.; and Akagi, Kenichi, to Wang Laboratories, Inc. Digitizing pen. 307,421, 4-24-90, Cl. D14-114.000.

Thieroff, Alan J., Jr.; Kaplan, Larry T.; and Banchi, Andrew. Suntan lotion applicator. 307,490, 4-24-90, Cl. D28-7.000.

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Aschauer, Joseph G.; and Cuccio, John, 307,418, Cl. D14-151.000.

Tornros, Mats: *See*—
Holmer, Anders; Pettersson, Owe; Tornros, Mats; and Maddock, Peter, 307,415, Cl. D13-164.000.

Tozawa, Katsumi: *See*—
Fushiya, Fusao; and Tozawa, Katsumi, 307,463, Cl. D23-225.000.

Trico Products Corporation: *See*—
Mower, Peter; and Pethers, Peter C., 307,408, Cl. D12-155.000.

Tropar Manufacturing Co., Inc.: *See*—
Ilaria, Peter V.; and Macowski, William, 307,396, Cl. D10-24.000.

Trujillo, Rebeca: *See*—
Gonzalez, Vivian; and Trujillo, Rebeca, 307,476, Cl. D24-47.000.
Gonzalez, Vivian; and Trujillo, Rebeca, 307,477, Cl. D24-47.000.

Tsukada, Masamichi: *See*—
Umemoto, Shouji; Tsukada, Masamichi; and Kitagawa, Masatoshi, 307,398, Cl. D10-46.000.

Tsukaguchi, Tamotsu: *See*—
Adachi, Koushiro; Shibuya, Shinji; Tsukaguchi, Tamotsu; and Miyamoto, Mitsuo, 307,420, Cl. D14-102.000.

Umemoto, Shouji; Tsukada, Masamichi; and Kitagawa, Masatoshi, to Hitachi, Ltd. Atomic absorption spectrophotometer. 307,398, 4-24-90, Cl. D10-46.000.

Unidynamics Corporation: *See*—
Ficken, Leonard A., 307,446, Cl. D20-4.000.

Universal Symetrics Corporation: *See*—
Mednis, Juris M., 307,390, Cl. D9-375.000.

Usami, Seiji; Yanagihara, Yoshihiro; and Mitsui, Hiroyuki, to Sharp Corporation. Remote controller for video tape recorder. 307,432, 4-24-90, Cl. D14-218.000.

Utsuki, Toshiyuki; Kouno, Shuichi; and Watanabe, Kenichi, to Hitachi, Ltd. Electric fan. 307,470, 4-24-90, Cl. D23-378.000.

Villa, Ezio: *See*—
Guelfi, Giorgio; Villa, Ezio; Mendicino, Franco; Pasquali, Renato; and Alberti, Alberto, 307,404, Cl. D12-92.000.

Wang Laboratories, Inc.: *See*—
Tedham, Thomas A.; and Akagi, Kenichi, 307,421, Cl. D14-114.000.

Warren, Robert D.: *See*—
Poisson, Norman D.; Searle, Scott G.; Warren, Robert D.; Kapec, Jeffrey; and Tanaka, Kazuna, 307,444, Cl. D19-55.000.

Watanabe, Katsuhiro: *See*—
Omino, Seiichi; Endo, Aiko; and Watanabe, Katsuhiro, 307,440, Cl. D18-13.000.

Watanabe, Kenichi: *See*—
Utsuki, Toshiyuki; Kouno, Shuichi; and Watanabe, Kenichi, 307,470, Cl. D23-378.000.

Watanabe, Tadao, to DIA Chemical Co., Ltd. Container for releasing perfume. 307,489, 4-24-90, Cl. D28-5.000.

Watanabe, Takuma: *See*—
Takasuna, Masahito; and Watanabe, Takuma, 307,466, Cl. D23-351.000.

Weckman, Richard L., to Owens-Illinois Plastic Products Inc. Bottle. 307,392, 4-24-90, Cl. D9-376.000.

Westphal, Dennis; and Piles, Jonathan, to CertainTeed Corporation. Design for a window component extrusion. 307,484, 4-24-90, Cl. D25-124.000.

Westphal, Dennis; and Piles, Jonathan, to CertainTeed Corporation. Window component extrusion. 307,485, 4-24-90, Cl. D25-124.000.

Westphal, Dennis; and Piles, Jonathan, to CertainTeed Corporation. Design for a window component extrusion. 307,486, 4-24-90, Cl. D25-124.000.

Wetherell, Richard B., Jr., to Innopak Plastics Corporation. Bottle. 307,394, 4-24-90, Cl. D9-378.000.

White, Michael T. Clothing hanger bracket for automobiles. 307,359, 4-24-90, Cl. D6-323.000.

White, Rodney J., to Speakerbus Limited. Telephone communication module or similar article. 307,433, 4-24-90, Cl. D14-240.000.

Whitney, James H. S. Cuticle treatment kit. 307,492, 4-24-90, Cl. D28-61.000.

Yamazaki, Shusuke: *See*—
Shimano, Kenji; Yamazaki, Shusuke; and Katagami, Yoshinori, 307,467, Cl. D23-351.000.

Yanagihara, Yoshihiro: *See*—
Usami, Seiji; Yanagihara, Yoshihiro; and Mitsui, Hiroyuki, 307,432, Cl. D14-218.000.

Yoshida Kogyo K. K.: *See*—
Asahi, Sadaho, 307,403, Cl. D11-221.000.

Zolliager, Chester L. Body pillow. 307,369, 4-24-90, Cl. D6-601.000.

LIST OF PLANT PATENTEES

H. J. A. Rooyakkers B.V.: *See*—
van Eijk, Joseph P., 7,223, Cl. 68.000.
Schmidt, Kathleen A.: *See*—
Schmidt, Melvin L., 7,222, Cl. 51.000.
Schmidt, Melvin L., to Schmidt, Melvin L.; and Schmidt, Kathleen A.
Magnificent Magenta Maple. 7,222, 4-24-90, Cl. 51.000.
van Eijk, Joseph P., to H. J. A. Rooyakkers B.V.; and World Flower B.V. Iris plant named Paris. 7,223, 4-24-90, Cl. 68.000.
World Flower B.V.: *See*—
van Eijk, Joseph P., 7,223, Cl. 68.000.

CLASSIFICATION OF PATENTS

ISSUED APRIL 24, 1990

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

6 4,918,752
10 4,918,753
16 4,918,754
161 R 4,918,755
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52 CT 4,919,787
59 4,919,788
61 4,919,789
78 4,919,790
99 4,919,792
131 4,919,793
354 4,919,794

CLASS 209

135 4,919,795
211 4,919,796
273 4,919,797
510 4,919,798
517 4,919,273
538 4,919,799
583 4,919,274

CLASS 210

94 4,919,800
104 4,919,801
188 4,919,802
198.2 4,919,803
4,919,804
332 4,919,805
334 4,919,806
388 4,919,807
490 4,919,808
500.23 4,919,809
500.34 4,919,810
500.36 4,919,811
519 4,919,812
603 4,919,813
4,919,814
4,919,815
638 4,919,816
639 4,919,817
660 4,919,818
662 4,919,819
671 4,919,820
698 4,919,821
747 4,919,822
749 4,919,823
770 4,919,824
783 4,919,825
788 4,919,826

CLASS 211

1.5 4,919,275
13 4,919,276
41 4,919,277
4,919,287
49.1 4,919,278
70.2 4,919,279
87 4,919,280
116 4,919,281
134 4,919,282

CLASS 212

160 4,919,283

CLASS 215

12.1 4,919,284
230 4,919,285
235 4,919,286
284 4,919,288

CLASS 219

10.55 B 4,920,246
103 4,920,247
124.34 4,920,248
130.21 4,920,249
216 4,920,250
401 4,920,251
497 4,920,252
506 4,920,253
547 4,920,254

CLASS 220

1 B 4,919,289
1 T 4,919,290
2.2 4,919,291
3.2 4,919,292
23.2 4,919,293
23.83 4,919,295
70 4,919,294
85 H 4,919,296
85 S 4,919,301
86 R 4,919,297
94 R 4,919,298
324 B1 3,942,680
404 4,919,299
408 4,919,300

CLASS 221

34 4,919,302

CLASS 222

1 4,919,303
3 4,919,304
55 4,919,305
105 4,919,306
137 4,919,307
146.5 4,919,308
153 4,919,309
386.5 4,919,310
401 4,919,311
402.2 4,919,312
541 4,919,313
643 4,919,314

CLASS 223

76 4,919,315

CLASS 224

42.42 4,919,316
151 4,919,317

CLASS 226

17 4,919,318
197 4,919,319

CLASS 227

19 4,919,320
69 4,919,321

CLASS 228

20 4,919,322
157 4,919,323

CLASS 229

68 R 4,919,324
71 4,919,325
109 4,919,326

CLASS 235

441 4,920,256
454 4,920,255

CLASS 236

49.1 4,919,327
49.3 4,919,328
93 R 4,919,329

CLASS 238

8 4,919,330

CLASS 239

2.2 4,919,331
3 4,919,335
11 4,919,336
205 4,919,332
4,919,337
223 4,919,333
587 4,919,338
600 4,919,334

CLASS 241

5 4,919,339
4,919,340
18 4,919,341
25 4,919,342
32 4,919,344
36 4,919,343
4,919,345
46.02 4,919,346
65 4,919,347
215 4,919,348
4,919,349

CLASS 242

55.2 4,919,350
56 A 4,919,352
56 R 4,919,351
58.6 4,919,353
67.3 R 4,919,354
68.4 4,919,358
107.4 A 4,919,355
125.1 4,919,359
130.2 4,919,363
199 4,919,356
4,919,357
260 4,919,360
303 4,919,362
309 4,919,361

CLASS 244

55 4,919,364
153 R 4,919,365
160 4,919,366
164 4,919,367

CLASS 248

27.3 4,919,369
56 4,919,370
4,919,371
4,919,372
74.3 4,919,373
95 4,919,374
121 4,919,368
152 4,919,375
154 4,919,381
178 4,919,382
185 4,919,376
225.1 4,919,377
231.6 4,919,379
295.1 4,919,378
311.2 4,919,380
349 4,919,383
447 B1 4,254,929
475.1 4,919,385
544 4,919,386
646 4,919,384
921 4,919,387

CLASS 249

115 4,919,388

CLASS 250

201.1 4,920,257
214 AL Re.33,205
221 4,920,260
225 4,920,261
227.11 4,920,262
237.13 4,920,259
255 4,920,263
282 4,920,264
308 4,920,265
324 4,920,266
327.2 4,920,267
353 4,920,268
364 4,920,269
4,920,270
390.01 4,920,271
475.2 4,920,272
560 4,920,273
561 4,920,274
574 4,920,275

CLASS 251

6 4,919,389
129.15 4,919,390
148 4,919,391

CLASS 252

8.553 4,919,827
8.75 4,919,828
25 4,919,829
47.5 4,919,831
50 4,919,832
77 4,919,833
90 4,919,834
91 4,919,835
94 4,919,836
106 4,919,837
117 4,919,838
153 4,919,839
182.3 4,919,840
186.26 4,919,841
186.43 4,919,842
327 E 4,919,830
358 4,919,843
373 4,919,844
526 4,919,845
542 4,919,846
558 4,919,847
600 4,919,848

CLASS 254

126 4,919,392
337 4,919,393

CLASS 256

65 4,919,394

CLASS 261

36.1 4,919,849

CLASS 264

1.4 4,919,850
1.5 4,919,851
3.1 4,920,079
6 4,919,852
12 4,919,853
4,919,854
21 4,919,855
22 4,919,856
4,919,857
24 4,919,858
29.1 4,919,860
29.5 4,919,859
36 4,919,861
40.1 4,919,862
42 4,919,863
45.1 4,919,865
45.3 4,919,866
45.9 4,919,864
57 4,919,867
65 4,919,868
70 4,919,870
78 4,919,869
82 4,919,871
103 4,919,872
130 4,919,873
168 4,919,874
171 4,919,875
258 4,919,876
282 4,919,877
300 4,919,878
509 4,919,879
536 4,919,880

CLASS 266

103 4,919,395
182 4,919,396
267 4,919,397
283 4,919,398

CLASS 267

31 4,919,399
140.1 4,919,400
4,919,401
4,919,402
165 4,919,403
260 4,919,404

CLASS 269

38 4,919,405
43 4,919,406
118 4,919,407
296 4,919,408

CLASS 271

34 4,919,409
4,919,410
35 4,919,411
110 4,919,412
133 4,919,413
227 4,919,414
284 4,919,415

CLASS 272

69 4,919,416
75 4,919,417
129 4,919,418
134 4,919,419

CLASS 273

1 GG 4,919,429
1.5 A 4,919,425
26 R 4,919,422
29 B 4,919,421
73 C 4,919,438
81 B 4,919,420
109 4,919,423
148 R 4,919,426
155 4,919,427
164 4,919,424
4,919,428
169 4,919,430
4,919,431
191 A 4,919,432
192 4,919,433
235 R 4,919,434
339 4,919,435
346 4,919,436
410 4,919,437

CLASS 277

27 4,919,439

CLASS 280

21.1 4,919,441
43.1 4,919,442

149.2 4,919,445
304.1 4,919,443
414.1 4,919,446
604 4,919,447
618 4,919,448
688 4,919,449
707 4,919,440
4,919,444
803 4,919,450
804 4,919,451
809 4,919,452

CLASS 285

3 4,919,453
18 4,919,454
23 4,919,455
39 4,919,456
4,919,457
110 4,919,458
140 4,919,459
141 4,919,460
174 4,919,461
175 4,919,462

CLASS 290

2 4,920,276
40 C 4,920,277

CLASS 292

120 4,919,463
251.5 4,919,464

CLASS 294

67.2 4,919,465
170 4,919,466

CLASS 296

24.1 4,919,467
4,919,477
97.4 4,919,468
97.6 4,919,469
153 4,919,470
154 4,919,471
180.2 4,919,472
188 4,919,473
194 4,919,474
213 4,919,475

CLASS 297

85 4,919,478
195 4,919,479
244 4,919,480
258 4,919,481
379 4,919,482
395 4,919,483
443 4,919,485
4,919,486
445 4,919,487
468 4,919,488
474 4,919,484

CLASS 301

44 T 4,919,489
63 PW 4,919,490
124 R 4,919,491

CLASS 303

3 4,919,492
15 4,919,493
100 4,919,494
113 4,919,495
114 4,919,496
119 4,919,497

CLASS 307

262 4,920,278
264 4,920,279
296.2 4,920,280
308 4,920,281
442 4,920,282
443 4,920,283
475 4,920,284
542 4,920,286
4,920,287
571 4,920,285

CLASS 310

15 4,920,288
90 4,920,289
90.5 4,920,290
4,920,291
114 4,920,292
116 4,920,293
162 4,920,294
209 4,920,295
348 4,920,296

CLASS 312

241 4,919,498

CLASS 313

315 4,920,297
493 4,920,298

CLASS 315

98 4,920,299
209 R 4,920,300
241 S 4,920,301
307 4,920,302

CLASS 318

161 4,920,303
466 4,920,304
657 4,920,305
722 4,920,306

CLASS 320

28 4,920,307

CLASS 322

58 4,920,308

CLASS 323

269 4,920,309

CLASS 324

96 4,920,310
125 4,920,311
141 4,920,312
301 4,920,313
312 4,920,314
313 4,920,315
318 4,920,316
4,920,317
4,920,318
451 4,920,319

CLASS 328

155 4,920,320

CLASS 330

257 4,920,321

CLASS 331

17 4,920,322

CLASS 333

1.1 4,920,323
106 4,920,324
173 4,920,325

CLASS 335

284 4,920,326

CLASS 337

231 4,920,327

CLASS 338

21 4,920,328
333 4,920,329

CLASS 340

467 4,920,330
541 4,920,331
544 4,920,332
545 4,920,333
568 4,920,334
572 4,920,335
619 4,920,336
721 4,920,337
825.300 4,920,338
825.520 4,920,339
905 4,920,340

CLASS 341

15 4,920,341
22 4,920,342
33 4,920,343
118 4,920,344

CLASS 342

70 4,920,345
91 4,920,346
130 4,920,347
433 4,920,348

CLASS 343

702 4,920,352
4,920,353
709 4,920,349
4,920,350
756 4,920,351
901 4,920,354

CLASS 346

1.1 4,920,355
4,920,356
49 4,920,357
74.2 4,920,358
134 4,920,258
137 4,920,359
140 R 4,920,360
4,920,361
4,920,362
155 4,920,363
160 4,920,364

CLASS 350

6.6 4,919,499
4,919,500
6.8 4,919,501
4,919,502
96.12 4,919,504
96.18 4,919,505
4,919,506
96.19 4,919,507
96.2 4,919,503
96.20 4,919,508
4,920,366
96.21 4,919,509
4,919,510
96.29 4,919,511
4,919,512
96.33 4,919,513
96.34 4,919,514
128 4,919,515
4,919,518
171 4,919,516
174 4,919,517
253 4,919,519
331 T 4,919,520
362 4,919,521
389 4,919,522
450 4,919,524
567 4,919,523
604 4,919,525
4,919,526
613 4,919,527
620 4,919,528

CLASS 351

50 4,919,529
85 4,919,530

CLASS 354

81 4,920,367
145.1 4,920,368
400 4,920,369
402 4,920,370
410 4,920,371
412 4,920,372
457 4,920,373

CLASS 355

27 4,919,531
4,920,374
4,920,375
4,920,376
55 4,920,377
68 4,920,378
210 4,920,379
219 4,920,380
260 4,920,381
284 4,920,382
311 4,920,383
4,920,384

CLASS 356

28.5 4,919,532
4,919,536
30 4,919,533
73 4,919,534
237 4,920,385
328 4,919,537
417 4,920,386
429 4,919,535

CLASS 357

17 4,920,387
23.4 4,920,388
23.6 4,920,389
4,920,390
4,920,391
23.7 4,920,392
23.8 4,920,393
30 4,920,394
4,920,395
42 4,920,396
4,920,397
4,920,398
4,920,399
58 4,920,400
59 4,920,401
68 4,920,402
71 4,920,403
72 4,920,404
74 4,920,405
4,920,406

CLASS 358

21 R 4,920,407
31 4,920,408
56 4,920,409
67 4,920,410
80 4,920,411
95 4,920,412
98 4,920,413
133 4,920,414
183 4,920,415
198 4,920,416
209 4,920,417
213.28 4,920,418
214 4,920,419
227 4,920,420
296 4,920,421
4,920,422
334 4,920,425
335 4,920,423
343 4,920,424
433 4,920,426
437 4,920,427
461 4,920,428
471 4,920,429
481 4,920,430
496 4,920,431

CLASS 360

33.1 4,920,432
64 4,920,433
68 4,920,461
77.08 4,920,434
77.15 4,920,435
78.04 4,920,462
96.1 4,920,436
99.05 4,920,437
104 4,920,438
130.21 4,920,439
132 4,920,440
133 4,920,441
137 4,920,442

CLASS 361

56 4,920,443
4,920,444
91 4,920,445
93 4,920,446
4,920,447
102 4,920,448
216 4,920,449
282 4,920,450
286 4,920,451
305 4,920,452
385 4,920,574
392 4,920,453
398 4,920,454
424 4,920,455
428 4,920,456
530 4,920,457

CLASS 362

33 4,920,458
61 4,920,459
4,920,460
4,920,463
72 4,920,464
96 4,920,465
105 4,920,466
226 4,920,467
287 4,920,468
300 4,920,469

CLASS 363

21 4,920,470
22 4,920,471
95 4,920,472
96 4,920,473
97 4,920,474
132 4,920,475

CLASS 364

140 4,920,476
200 4,920,477
4,920,478
4,920,479
4,920,480
4,920,481
4,920,482
4,920,483
4,920,484
4,920,485
4,920,486
300 4,920,487
403 4,920,488
413.06 4,920,489
413.13 4,920,490
413.19 4,920,491
419 4,920,492
426.01 4,920,493
431.05 4,920,494
474.37 4,920,495
481 4,920,496
491 4,920,497
497 4,920,498
513 4,920,499
4,920,500
518 4,920,501
4,920,502
521 4,920,503
4,920,504
4,920,514
525 4,920,505
602 4,920,506
724.17 4,920,507
736 4,920,508
784 4,920,509
825 4,920,510
900 4,920,511

CLASS 365

160 4,920,512
175 4,920,513
189.08 4,920,515
203 4,920,516
207 4,920,517
228 4,920,518

CLASS 366

4 4,919,538
94 4,919,539
132 4,919,540
136 4,919,541
161 4,920,519

CLASS 367

99 4,920,520
103 4,920,521
134 4,920,522
188 4,920,523

CLASS 368

240 4,920,524
242 4,920,365
250 4,920,525
281 4,920,526

CLASS 369

45 4,920,527
54 4,920,528

CLASS 370

16 4,920,529
32.1 4,920,530
60 4,920,531
85.1 4,920,532
85.2 4,920,533
94.1 4,920,534
105.1 4,920,535

CLASS 371

5.1 4,920,537
10.1 4,920,536
19 4,920,538
40.2 4,920,539
61 4,920,540

CLASS 372

23 4,920,541
50 4,920,542

CLASS 374

9 4,919,542
139 4,919,543

CLASS 375

10 4,920,543
26 4,920,544
58 4,920,545
106 4,920,546
112 4,920,547

CLASS 376

255 4,920,548
260 4,919,881
293 4,919,882
352 4,919,883
419 4,919,884

CLASS 377

16 4,920,549

CLASS 378

51 4,920,550
125 4,920,551
153 4,920,552
173 4,920,553
200 4,920,554

CLASS 379

21 4,920,555
51 4,920,556
61 4,920,557
67 4,920,558
74 4,920,559
100 4,920,560
106 4,920,561
132 4,920,562
399 4,919,544
413 4,920,563
437 4,920,564

CLASS 380

6 4,920,565
19 4,920,566
25 4,919,545
33 4,920,567

CLASS 381

46 4,920,568
61 4,920,569
68 4,920,570

CLASS 382

6 4,920,573
47 4,920,571
48 4,920,572

CLASS 383

33 4,919,546

CLASS 384

15 4,918,846
19 4,919,548
110 4,919,547
113 4,919,549
133 4,919,550
482 4,919,551
492 4,919,552

CLASS 400

120 4,919,553
224.2 4,919,555
419 4,919,554

CLASS 401

57 4,919,556

CLASS 402

41 4,919,557

CLASS 403

9 4,919,558
13 4,919,559
16 4,919,562
268 4,919,560
305 4,919,561

CLASS 404

6 4,919,563
25 4,919,564
41 4,919,565
121 4,919,566

CLASS 405

19 4,919,567
43 4,919,568
128 4,919,569
4,919,570
199 4,919,571
212 4,919,572

CLASS 407

40 4,919,573

CLASS 409

219 4,919,574
231 4,919,575

CLASS 411

34 4,919,576
43 4,919,577
55 4,919,579
113 4,919,578
173 4,919,580
353 4,919,581

CLASS 414

233 4,919,582
528 4,919,583
540 4,919,584
718 4,919,585
735 4,919,586
795.8 4,919,587
798.4 4,919,588
798.9 4,919,589

CLASS 415

116 4,919,590
152.1 4,919,591
207 4,919,592

CLASS 416

223 A 4,919,593
230 4,919,594

CLASS 417

18 4,919,595
4,919,596
63 4,919,600
362 4,919,598
403 4,919,597
423.4 4,919,599

CLASS 418

51 4,919,601

CLASS 420

104 4,919,885
420 4,919,886

CLASS 422

26 4,919,888
40 4,919,889
56 4,919,890
58 4,919,891
4,919,892
67 4,919,887
78 4,919,893
104 4,919,894
129 4,919,895
142 4,919,896
165 4,919,897
219 4,919,898
245 4,919,899
4,919,900
249 4,919,901

CLASS 423

213.5 4,919,902
4,919,903
225 4,919,904
239 4,919,905
323 4,919,906
326 4,919,907
328 4,919,908
348 4,919,913
360 4,919,909
422 4,919,910
499 4,919,911

574 R 4,919,912
576.2 4,919,914
658.5 4,919,716

CLASS 424

7.1 4,919,915
10 4,919,916
4,919,917
44 4,919,918
45 4,919,919
61 4,919,920
62 4,919,921
63 4,919,922
70 4,919,923
72 4,919,924
76.1 4,919,925
81 4,919,926
85.91 4,919,927
4,919,928
88 4,919,929
4,919,930
95 4,919,931
114 4,919,932
196.1 4,919,933
401 4,919,934
405 4,919,935
442 4,919,936
449 4,919,937
450 4,920,016
480 4,919,938
493 4,919,939

CLASS 425

12 4,919,602
4,919,603
458 4,919,604
467 4,919,605
531 4,919,607
549 4,919,606
556 4,919,608

CLASS 426

2 4,919,940
5 4,919,941
38 4,919,942
39 4,919,943
4,919,944
69 4,919,945
89 4,919,946
94 4,919,947
106 4,919,948
128 4,919,949
233 4,919,950
241 4,919,951
254 4,919,952
273 4,919,953
308 4,919,954
394 4,919,955
465 4,919,956
513 4,919,957
564 4,919,964
573 4,919,958
574 4,919,959
580 4,919,960
4,919,961
594 4,919,962
599 4,919,963
615 4,919,965

CLASS 427

2 4,919,966
8 4,919,967
37 4,919,968
58 4,919,969
96 4,919,970
98 4,919,971
160 4,919,972
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CLASS 432

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D2—	314	307,350			307,375		157	307,402			307,428		196	307,454		68	307,480
	320	307,351	D8—	8	307,377		221	307,403			307,429		219	307,455		122	307,481
	609	307,352		10	307,378	D12—	92	307,404			307,430	D22—	106	307,456			307,482
D3—	10	307,353		14.1	307,379		118	307,405		165	307,431		137	307,457			307,483
	30.1	307,354		61	307,380		147	307,406		218	307,432		141	307,458		124	307,484
	40	307,355		95	307,381			307,407		240	307,433			307,459			307,485
D6—	301	307,356		97	307,382		155	307,408	D15—	10	307,434	D23—	207	307,460			307,486
		307,357			307,383		181	307,409		145	307,435		209	307,461	D26—	2	307,487
	302	307,358		373	307,384			307,410	D18—	12	307,436			307,462		49	307,488
	318	307,360	D9—	302	307,385			307,411			307,437		225	307,463	D28—	5	307,489
	323	307,359		341	307,386		198	307,412			307,438		251	307,464		7	307,490
	347	307,361			307,387		203	307,413		13	307,439		289	307,465		50	307,491
		307,362		345	307,388		307	307,414			307,440		351	307,466		61	307,492
		307,363		370	307,389	D13—	164	307,415	D19—	34	307,441			307,467		64	307,493
	381	307,364		375	307,390			307,416			307,442		366	307,468			
	429	307,365		376	307,391		183	307,417		43	307,443		367	307,469	D29—	5	307,494
	529	307,366			307,392	D14—	100	307,419		55	307,444		378	307,470	D30—	108	307,495
	552	307,367			307,393		102	307,420		78	307,445	D24—	16	307,471	D32—	14	307,496
	601	307,368		378	307,394		114	307,421	D20—	4	307,446			307,472		40	307,497
		307,369		428	307,395		115	307,422		10	307,447			307,473	D34—	31	307,498
	611	307,370	D10—	24	307,396			307,423		43	307,448		25	307,474		43	307,499
D7—	616	307,373		46	307,397		135	307,424	D21—	34	307,449		36	307,475		45	307,500
	622	307,372			307,398			307,425		35	307,450		47	307,476	D99—	26	307,501
	652	307,376			307,399		142	307,426			307,451			307,477			307,502
	677	307,371		106	307,400		151	307,418		107	307,452		51	307,478		34	307,503
	695	307,374	D11—	108	307,401			307,427		108	307,453	D25—	48	307,479		36	307,504

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	307,373		307,473		307,448	29	307,359		307,370		307,495
	307,452		307,500	19	307,368		307,442		307,371	42	307,384
	307,475	08	307,471	20	307,484		307,446		307,402		307,400
05	307,474	09	307,394		307,485	32	307,454		307,417		307,488
06	307,352		307,418		307,486	34	307,374		307,419		307,490
	307,367	12	307,441	22	307,365		307,375		307,434	47	307,381
	307,380		307,476		307,502		307,379	37	307,355	48	307,358
	307,387		307,477	25	307,350		307,390		307,364		307,465
	307,422		307,497		307,421		307,396		307,366	49	307,369
	307,428	13	307,393		307,443		307,481	38	307,389	51	307,353
	307,429	16	307,456		307,444		307,482	39	307,378		307,492
	307,447	17	307,427	26	307,409		307,483		307,392	55	307,395
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	307,450	18	307,361		307,411		307,499		307,487		

PLANT PATENTS

20	7,222					

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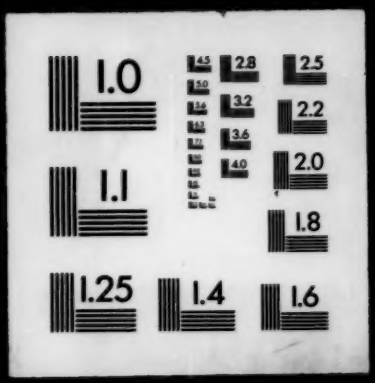
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